

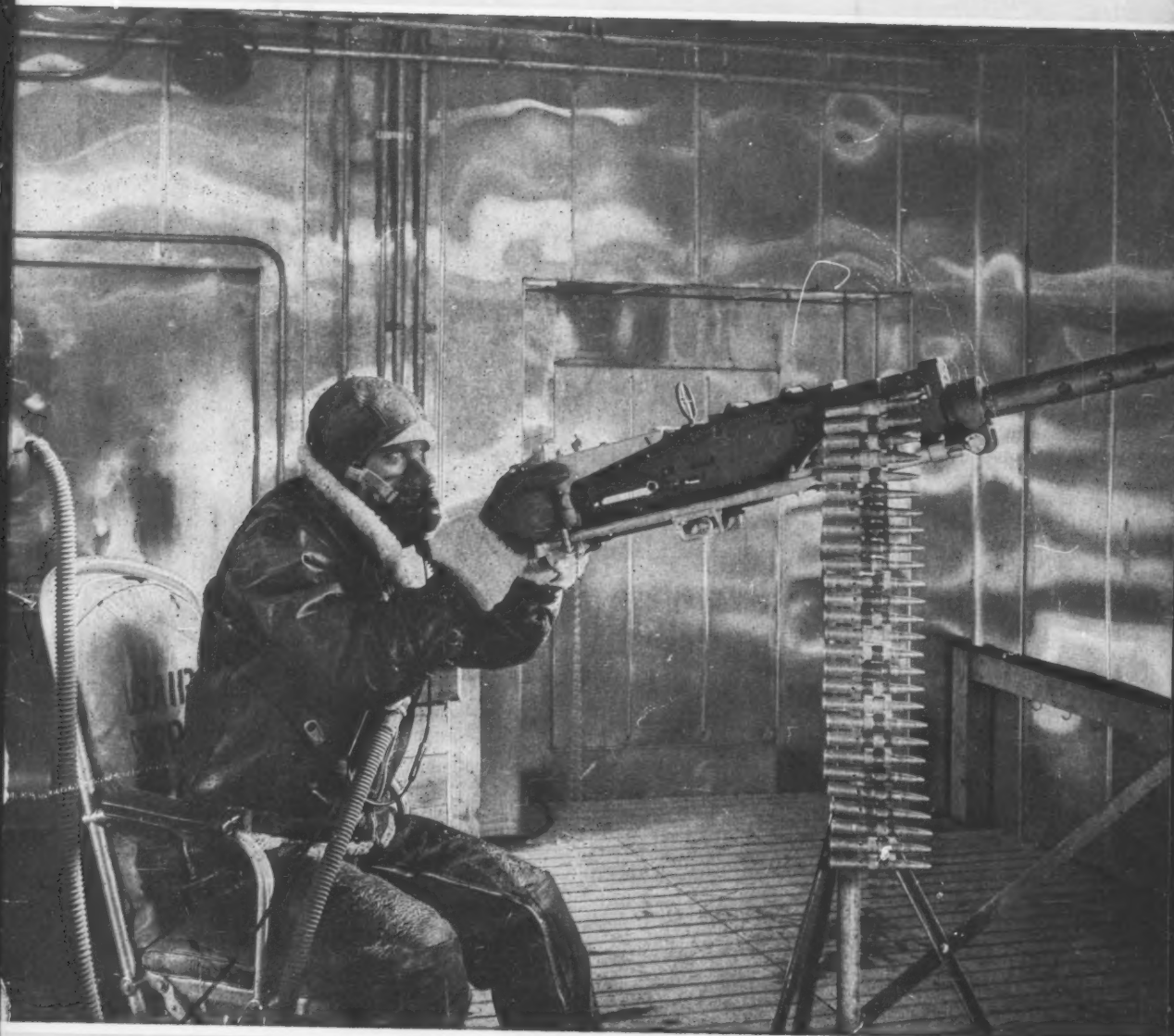
JUNE 1944

✓ JAN 945C 117

THE Refrigeration Industry

INSTALLATION
MAINTENANCE
MERCHANDISING

AIR CONDITIONING
MACHINERY



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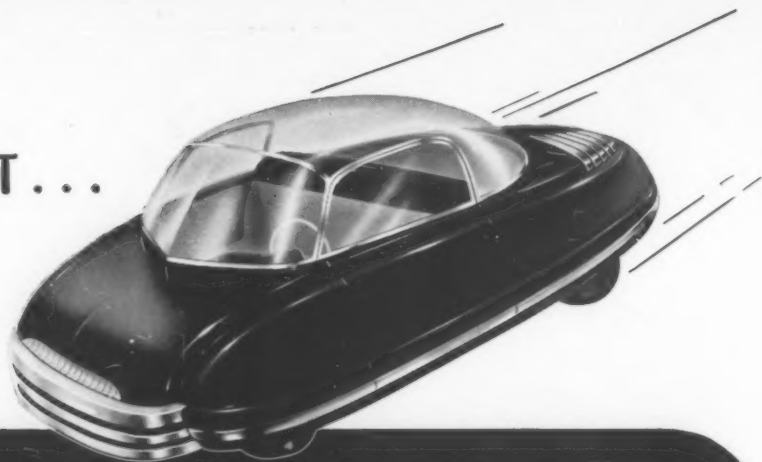
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Refrigeration

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I PREDICT...



by George W. Walker

Industrial Designer of Detroit

"The car you will own, in what engineers call the *post* post-war period, will take greater advantage of streamlining for beauty and efficiency. Running boards will disappear, permitting wider bodies and more seating room. There will be foam rubber upholstery, soundproofing, opaque colored plastic panels and plexiglass windshields and tops that will provide greater visibility and safety. The small car sketched here is designed with the engine in the rear and enclosed running gear, permitting an extremely short turning radius. The car your War Bonds will buy will be fully air-conditioned, making window ventilation unnecessary and eliminating the present-day annoyance of draughts, rain and dust."

Note: The Weatherhead Company, one of the oldest and most important manufacturers of parts for the automotive industry, is prepared for the day when its four plants will again be contributing to the country's peacetime automotive needs.



FREE: Write on company letterhead for "Seeds Of Industry"—a history of The Weatherhead Company, its many facilities and diversified products.

Look Ahead with

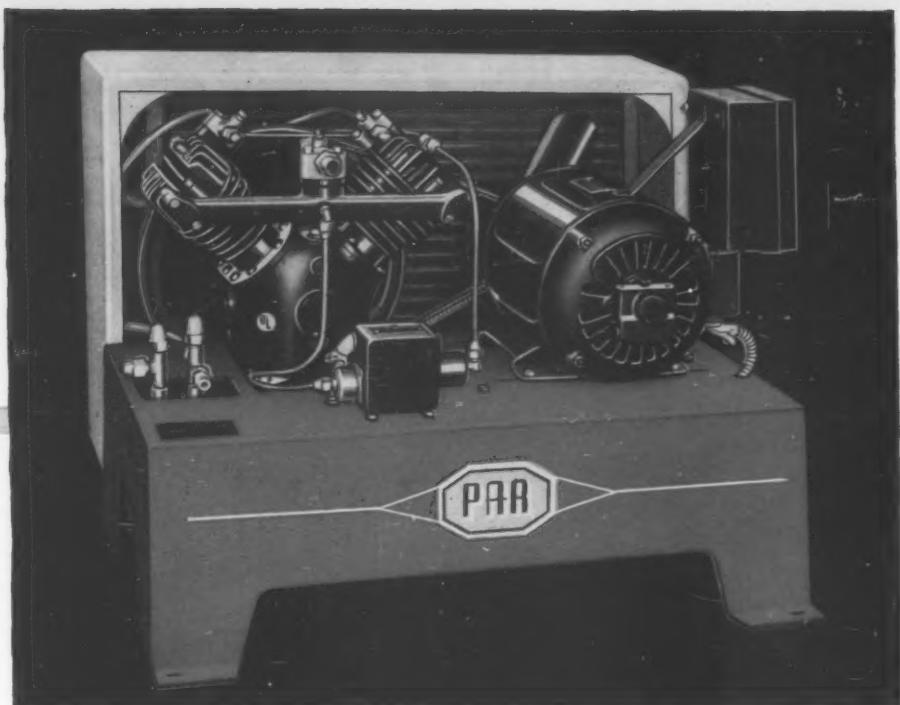


Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO

Manufacturers of vital parts for the automotive, aviation, refrigeration and other key industries.

Plants: Cleveland, Columbia City, Ind., Los Angeles
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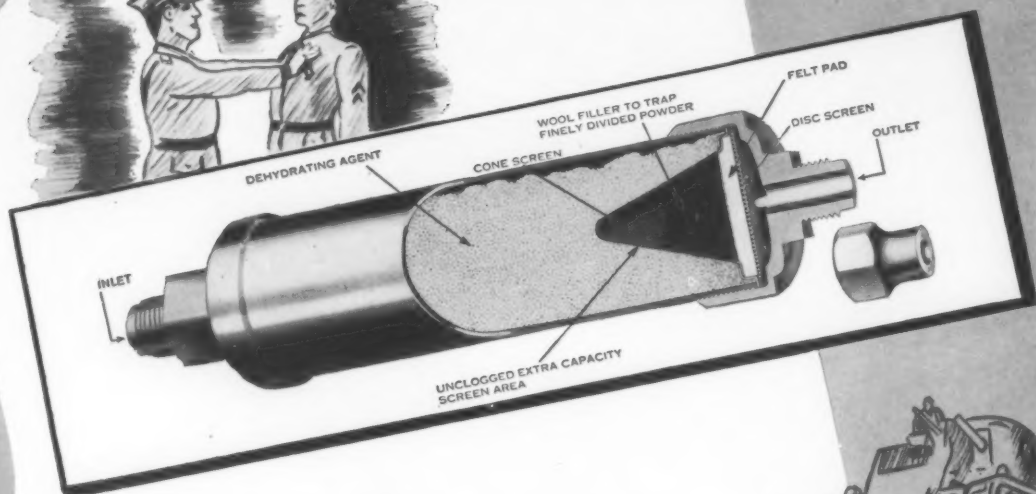


Par Model HA-20

- A big air cooled unit for applications where low cost abundant water supply is not available.
- 2 H.P. 4 cylinder model with extra large surface condenser to give efficient service.
- For large soda fountains, dairy coolers, reach-ins and walk-in coolers.
- Write for illustrated brochure of details.
- BY COMPARISON—YOU'LL BUY PAR.

PAR Division

LYNCH
MANUFACTURING
CORPORATION
Defiance, Ohio, U.S.A.



FOR *Efficient Service*

● Mueller Brass Co. dehydrators are provided with a special cone screen and other advantageous features which assure greatly increased efficiency in service (note illustration above.)

When a dehydrator is in operation there is a tendency for small particles of its drying agent to lodge on the face of the outlet filter. This condition will increase, particularly with dehydrators furnished with the old style flat disc screens, until the line is greatly restricted through clogging.

Restriction results in pressure drop, causing some evaporation of the liquid into gas. This mixture of liquid and gas causes trouble at the expansion valve. A decided temperature drop at the outlet of the dehydrator is an indication to the service man of this trouble.

The Mueller Brass Co. improved dehydrator is designed to correct this condition. The cone-shaped screen, filled with pure wool, directs the fine particles of the drying agent to the outside of the base of the cone. Any particles that get through the screen will lodge in the wool filler without clogging, leaving the center free for the passage of the refrigerant.

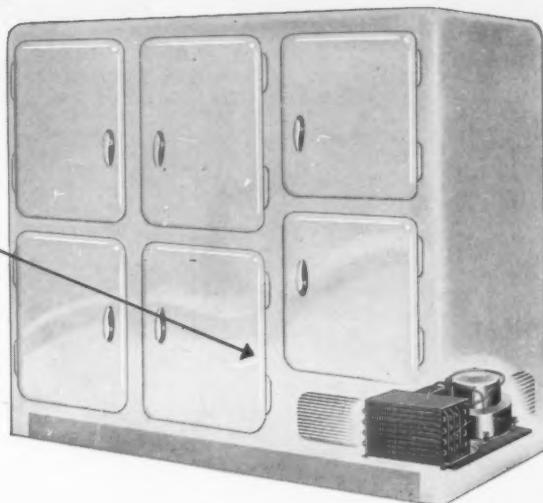
Mueller Brass Co. dehydrators are furnished in all practical styles and sizes— heavy copper shell and forged brass ends soldered in place. Write us for illustrated descriptive literature.



MUELLER
BRASS CO.
PORT HURON, MICH.

Universal Cooler Post-War Hermetics are..

All Purpose Engineered*



...for more simplified, efficient adaption to your requirements

The success record of your post-war refrigeration product will depend heavily, as always, on the "power plant" inside. Universal Cooler's new line of field-tested hermetic refrigerating units—low, compact advance design and all-purpose engineered*—are built to meet a wide range of applications with new standards of trouble-free performance.

Let's Ask Universal Cooler

Universal Cooler's design, research and test facilities are at your disposal for product development now. Write for the illustrated book "Refrigeration Is Our Business!"

***ALL-PURPOSE ENGINEERING** is the art of making a thing in simplest form for the widest possible range of applications and/or conditions.

EXAMPLE: that beloved, belligerent little jack-of-all-jobs, the jeep. Because of its amazing versatility, the jeep strikingly typifies All-Purpose Engineering.

In refrigeration, Universal Cooler leads the field in applying All-Purpose Engineering.



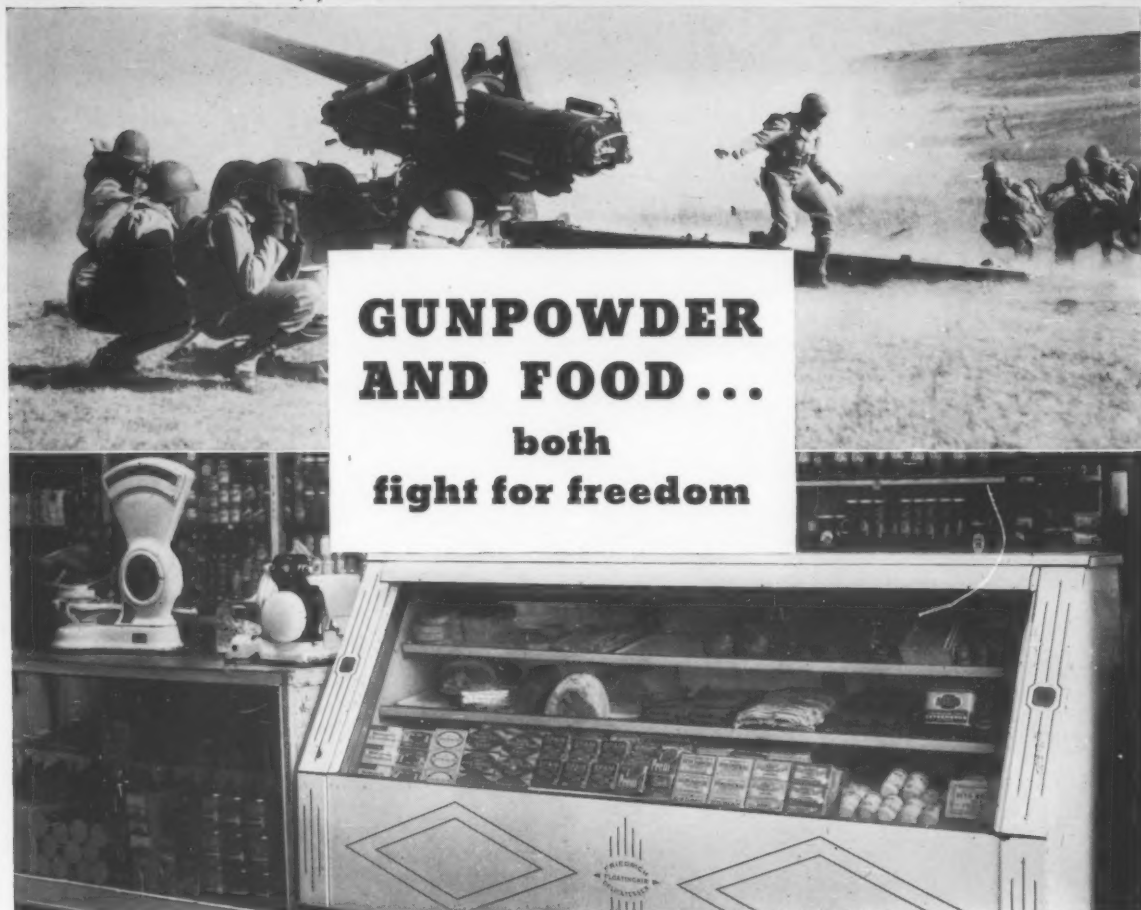
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GUNPOWDER AND FOOD... both fight for freedom

Today, thanks to technical advances in powder making, plus refrigeration and air conditioning, there is so little variation in powder that gunners know exactly what shell velocity will be. The result? A more accurate gun fire that has contributed to important American victories. Refrigeration and air conditioning keep powder at the correct temperature and humidity levels, not only in the making of the powder, but also in storage places ashore and in powder magazines aboard ship.

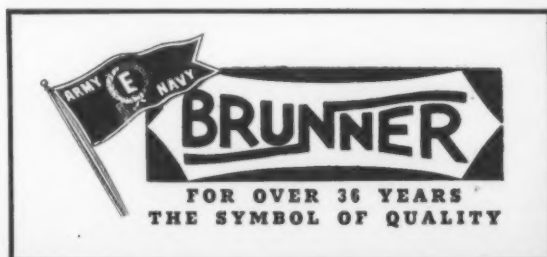
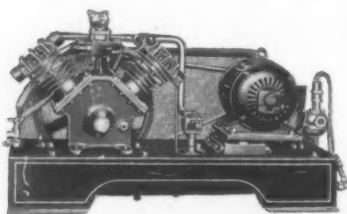
Good wholesome food also fights for freedom both on the battle and home fronts! It must, however, be protected from spoilage and bacteria by proper refrigeration.

Brunner condensing units are playing a vital part in the making and storing of gun powder as well as in the preservation of our nation's—and that of our allies—food supply on all fronts. The lessons we are learning in the production of condensing units for rapidly

multiplying applications essential to the winning of the war, will be applied to good advantage in the production of even more efficient peacetime equipment.

BRUNNER—the symbol of a better day to come—when refrigeration and air conditioning will widen our zones of production—and our well-being—in a world at peace.

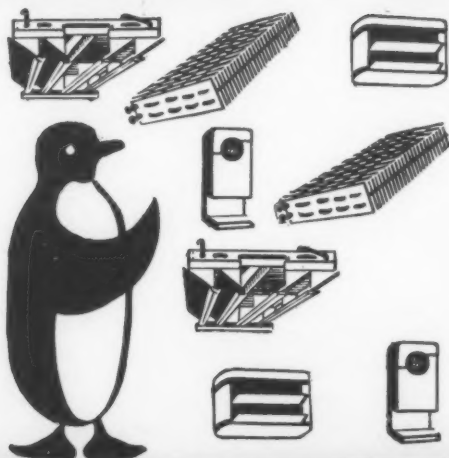
Why not consult our engineers—experts in commercial and industrial refrigeration and air conditioning—on any temperature or humidity problem? Brunner Manufacturing Company, Utica, New York, U. S. A.



Flying Colors



BUSH HEAT TRANSFER UNITS are serving with the Army, Navy, Air Forces and Merchant Marine . . . meeting literally hundreds of cooling and air conditioning requirements . . . from battleship magazines to cantonment kitchens . . . from submarines to high altitude fighters. **BUSH Products** are fighting on a hundred fronts . . . doing their part on every continent to increase the efficiency and effectiveness of United Nations men and materiel. All this adds up to experience . . . "know how." Let this experience and "know how" serve **YOU!** For advanced engineering . . . **BUY BUSH.** Ask your Jobber!



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Sporlan CONTROLLED PERFORMANCE valves are the *only* thermostatic expansion valves with elements specifically charged to fit the application of the valve. These *selective charges* (G-K-U-Z-O-L-C) are designed to give the best operating characteristics for each type of installation. Only by using SPORLAN valves can you be assured of PEAK Performance on EVERY installation.

Sporlan manufactures Solenoid Valves . . . Magnetic Pilot Controls . . . Modulating Pilot Controls . . . Refrigerant Distributors and the only Thermostatic Expansion Valves with Selective Charges. If your post war plans include refrigeration or air-conditioning write SPORLAN immediately.



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VALVES

SPOEHRER-LANGE CO.

3723 COMMONWEALTH AVE., ST. LOUIS 17, MO.

AMCOIL FOOD CONDITIONER

IT'S NEW IT'S DIFFERENT

It Combines

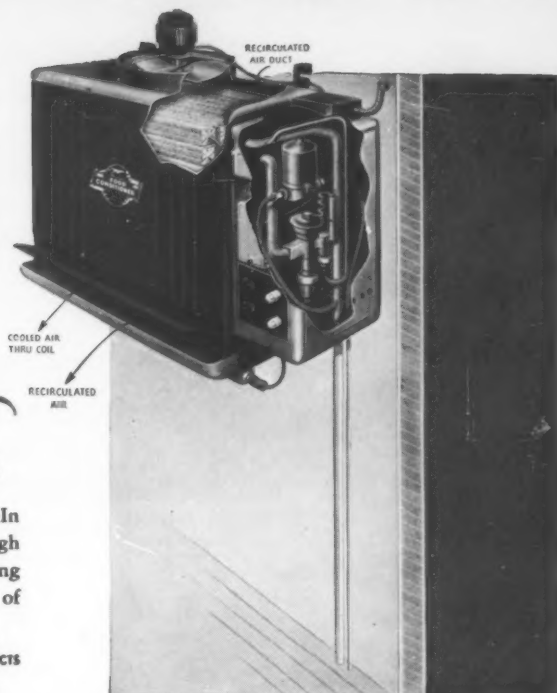
**Cooling Temperatures of 35° to 40° F.
And High, Controlled Humidities Up to 93%**

THE AMCOIL FOOD CONDITIONER is designed for use in Walk-In Boxes. The function of this new unit is to cool air and control high humidities, in that way preserve and save foods by eliminating dehydration. It is especially engineered for the preservation of

FRESH MEATS
FRUITS & VEGETABLES
PERISHABLE FOODS

BUTTER & CHEESE
EGG STORAGE
FLOWERS

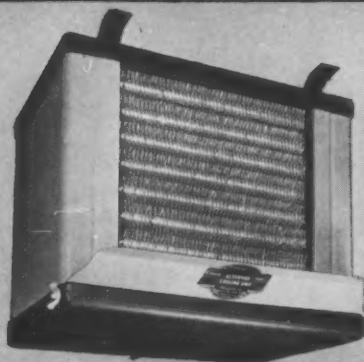
BAKERY PRODUCTS
CONFECTIONERS' PRODUCTS
DOUGH RETARDING



ARE YOU GETTING YOUR SHARE?

Recently published figures of the W. P. B. Task Committee show that the sales of commercial refrigeration equipment for replacement during 1944 will exceed \$100,000,000 in retail sales value.

ALSO AVAILABLE NOW

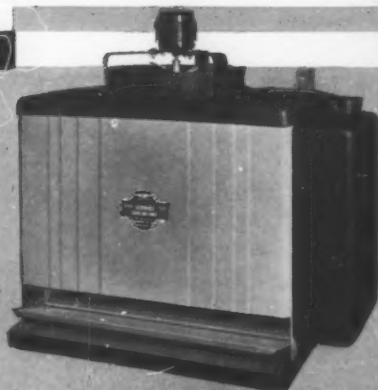


AMCOIL ALSERVICE OPENFACE COOLING UNIT

Is of standard design and serves as a general utility unit in preserving supplies and is used wherever a forced draft cooling unit is required. Temperatures down to 34° F.

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For use where dehydration is not a factor. Temperatures down to 34° F. It embodies some new principles of refrigeration developed by Amcoil Engineers.



These Amcoil units can be delivered now as replacement equipment on rated orders of AAS or better under L-38. They are made of the best materials, are Amcoil engineered and embody the engineering skill and experience gained in the manufacture of cabinets for testing war products under varying humidities and temperatures from - 100° to + 160° F.



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YOUR BEST WEAPON IN THE WAR ON MOISTURE

One piece streamlined shell provides greater strength than old designs—facilitates flow of refrigerant.

Filled with Silica Gel.

Copper and brass construction throughout.

Finger type strainer of 200 mesh bronze screen, integral with outlet connection. Simply unscrew connection to refill dehydrator or clean screen.



Brazed — no soft solder joint that might loosen.

Fewer joints — less chance for leakage.

Available in sizes up to 7 H.P.

Easy to refill—no bolts to unscrew and no flanges, springs or loose screens to remove before refilling.

The **TORPEDO** that smashed old ideas of Dehydrator design . . .

● When the Imperial Torpedo Dehydrator was announced in 1940, it introduced an entirely new conception of dehydrator design and dehydrator efficiency.

It pioneered the one piece streamlined shell (from which it took its name "Torpedo"). This design offers such marked advantages as greater strength, easier passage of refrigerant and fewer joints.

And it introduced the finger-type outlet screen which provides more efficient filtering, less chance of clogging and easier removal for cleaning and refilling.

Sectional view above evidences its leadership in design and shows why it has won widespread preference in the industry.

THE IMPERIAL BRASS MFG. CO., 536 So. Racine Ave., Chicago 7, Ill.

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FITTINGS • VALVES • DEHYDRATORS • FILTERS • FLOATS • CHARGING LINES
TOOLS FOR CUTTING, FLARING, BENDING, COILING, PINCH-OFF AND SWEDGING

JUNE, 1944

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Industry*

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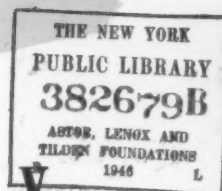
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The Refrigeration INDUSTRY



C O N T E N T S

THE COVER . . . The aircraft industry must have adequate refrigerated testing chambers to develop safe equipment and clothing. This one is at Wright Field, Dayton, O. Courtesy Electro Metallurgical Co.

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All material and data presented in this issue has been reviewed by the necessary Services censorship divisions.

The paper for this magazine comes within the legal quota limits as established by the War Production Board.

There is A DIFFERENCE in SILICA GEL

ONLY DAVISON'S SILICA GEL
HAS PROVEN PERFORMANCE

All silica gel is not alike! It may look alike but the real difference is in performance.

Davison developed Davison's Silica Gel for the refrigeration industry . . . it was perfected under close collaboration with refrigeration engineers. Every drying agent requirement they set up was taken into consideration and the result was a Superior Silica Gel that could be marketed to the refrigeration industry with confidence that it would out-perform not only any other drying agent . . . but any silica gel that was not manufactured expressly for the refrigeration industry.

Thus, the name Davison protects you! When you use Davison's Silica Gel you will be certain to get the Silica Gel results you have heretofore taken for granted.

Play safe. Avoid expensive and time-consuming call backs, freeze-ups, breakdowns. Specify and use Davison's Silica Gel. . . There is a difference.

THE DAVISON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DEPARTMENT
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**LOOK FOR THE
DAVCO LABEL**
...it's your protection against trouble

"DAVISON'S" ADVANTAGES

- 1—GREATER CAPACITY—1½ to 2 times as much as other types of drying agents.
- 2—ACTS INSTANTLY—No waiting, no delayed action in any system.
- 3—REMOVES ACIDS—Prevents formation of corrosive sludge.
- 4—WILL NOT DUST NOR POWDER—Refrigerant flows freely through entire system.
- 5—WILL NOT "CHANNEL" IN THE CARTRIDGE—Processed so that the refrigerant cannot pass through the cartridge without contacting Silica Gel.

ALWAYS ASK YOUR JOBBER FOR

DAVISON'S

Accelerated
SILICA GEL

We Say "Hello" to You

THIS is the first issue of this magazine and it is our bow into the refrigeration industry. We have a special message to deliver to you—and no special ax to grind. We are going to try to give you an interesting, timely and informative magazine that will bring you answers to some of your problems.

We invite you to unload some of your problems (all but domestic and financial ones) on our shoulders. We'll try to get you the answers. We'd like to hear from you. We'd like to have you tell us some of your experiences in the refrigeration field so that others may benefit. It is a trite saying, but we're going to say it anyhow—make it **YOUR** magazine.

As new government orders are to be interpreted, as new commercial developments appear, as new profit-making ideas come to light, we'll bring them to you. Please remember—this is not a newspaper, but a monthly magazine. As such, we can't get you split-second coverage that a newspaper can, but we'll do our best.

The circulation of this magazine, from its very inception, is the largest in the industry. Over 16,000 individuals will receive this first issue. Therefore, we have a peculiar obligation—the obligation of making this magazine cover every phase of this tremendously important and active field. We have the dual problem of reporting present activities and presenting significant trends. We hope to be able to give you such information as will bring you a clear picture of the field in which you are making your living—and help you do a better job in it.

If we make mistakes, bear with us—but tell us about them. (If we're good, tell us about that, too).

Your local jobber—the one's whose name is on the front and back cover has arranged with us for your subscription to **THE REFRIGERATION INDUSTRY**.

Irving B. Hexter

Publisher

CMP—9A

THE War Production Board has suggested that more electrical and mechanical repair shops take advantage of the WPB regulation designed to aid them. CMP Regulation 9-A provides that such shops may purchase up to 20 tons of carbon and alloy steel, 500 lbs. of copper base alloy and brass mill and foundry products, 200 lbs. of certain aluminum forms and shapes, $\frac{1}{8}$ of what they used in 1941 or up to \$150.00 worth of copper wire in any calendar quarter and as much other material and parts as he needs for maintenance work.

Using the specified methods for filling out this form eliminates the necessity of the repairman filing or waiting for ratings. The order covers maintenance, repair, reconditioning and rebuilding work and up to \$25.00 worth of material for the installation of equipment.

CHROMIUM

CHRONIUM, nickel or any alloy of these materials used in the manufacture of industrial instruments, control valves and regulators, have been taken off the restricted list. The action does not apply to previously placed orders.

ENZYMES

A MYSTERIOUS and complex group of chemicals, known as enzymes, derives the name from two Greek words meaning "In" and "Yeast." These materials are the products of fungi and are known today to turn wood into sugar, sugar into fat, help make cheese, beer and better leather. Normally, these work at the temperature of live organisms. Their action can be stopped by raising the temperature when their work is done.

The laboratories of Rohen & Haas, a Philadelphia concern, are now working on many of the enzymes and a big group, called pectinols, which are performing war time jobs. Complete concentration of evaporated fruit juices, and corn syrup that is twice as sweet as the old type, are two contributions of this group. Control of the "bating" process in the working of raw leather is another outgrowth of this new industrial field. Refrigeration plays an important role in the control of the process and the inhibition of action when the desired conditions are reached.

WAR REPORT

Shipments of combat materiel from 85 plants engaged primarily in the manufacture of domestic and commercial refrigeration equipment before the war reached an all-

time high of almost \$150,000,000 in the last quarter of 1943, according to the War Production Board.

Shipments of all products—combat materiel, refrigeration equipment, and other goods—from the same plants totaled more than \$200,000,000 for the same period. Enough unfilled orders of all kinds were on hand at the end of 1943 to keep the industry busy for about a year at the fourth-quarter rate of production. This does not take into consideration possible cutbacks in military programs.

Seventy-four of these plants were included among the 309 plants classified in the refrigeration equipment industry in 1939. They accounted for 90 percent of the total production (\$279,000,000) by the industry in that year and for 89 percent of the 35,000 wage earners then in the industry.

CHANGES IN P. O.'S

GENERAL rules governing the status of purchase orders by the people who originally place them have been issued by the WPB. Sometimes a change constitutes a new order, but at times a minor change cannot be construed to mean a revised purchase order. Listing the new rules now issued are the cases, for example, of:

1. A change in shipping directions (this does not constitute placing a new order).
2. A change in the date of delivery (a new order if it interferes with production or delays delivery).
3. Substitution of one allotment number for another (not a new order).
4. Change in preference rating (not a new order).
5. Directions to a manufacturer to hold or suspend production without specifying a new delivery date (constitutes a cancellation. The order may be reinstated within a period of ten days, with specific restrictions).
6. Increasing the total amount ordered (a new order to the extent of the increase unless it can be figured with negligible interference with previous order).

STAINLESS STEEL TUBING

WPB has removed restrictions on both stainless steel tubing and wall thickness of the tubing in assemblies for refrigerator condensers or coolers. This will increase the use of stainless steel tubing approximately 300 tons per quarter, it is estimated, and eliminate past difficulties in both manufacturing and operating of condensers or coolers. The practice of splitting of tubes, with the resultant hidden defects which did not show up until after use, led to maintenance and replacement problems and costs and considerable man-hours in repairing such items.



Refrigeration near the Equator can be a vital life and death matter. Sometimes amusing, sometimes grim, this story of experiences in Gura Eritrea makes interesting reading with a technical slant.

A. A. F. BASE . . .

By Irving A. Wilson
Superior Valve & Fittings Co.
Pittsburgh, Pa.

IN THE late spring of 1942, Paul Kordenot of Middletown, Ohio, George Harruff of Fresno, Calif. and I, having signed up as refrigeration technicians with Douglas Aircraft Corp. left the good old U.S.A. bound for Gura Eritrea. This was originally an Italian air base, which had been captured by the British, and at that time it was under reconstruction as an air base for the U. S. Army Air Forces.

Our job was to maintain service on both Italian and American refrigeration equipment which, we understood, was to have been installed and in operation prior to our arrival at the base.

We arrived at the base in July 1942 to find that all our refrigeration maintenance equipment, tools and supply of refrigerants, had been sunk enroute. Only a small percentage of refrigeration equipment was installed because of a series of delays



on the part of the general contractor who was building the base up from what the Italians left to an up-to-date air base to accommodate an estimated personnel of 5000—a tremendous undertaking, including streets, electric light and power, water supply, laun-

dry, hospital, hangars, runways, barracks, mess halls, bakery, and among other things, a cold storage plant approximately 250 feet by 100 feet.

Operating Difficulties

To add to the task was the fact that all of the material and equipment for the base was brought by ship to Massaua, on the Red Sea, and then hauled uphill by truck 90 miles over an ever winding, uphill road to the base, where the altitude was about 6500 feet above sea level.

Since, at the time of our arrival, the large cold storage plant was only in the foundation stage, our job was to work with Walter Lutz of Dayton, Ohio, who had arrived a month previous to our arrival to service (with what tools Lutz had been able to beg, borrow or steal) the very meager refrigeration equipment which already was in operation and doing its best to serve about 2500 civilian and military personnel.

This refrigeration equipment consisted of a 30 cu. ft. reach-in cabinet in the PX for cooling canned citrus fruit juices; a similar size reach-in box in Mess Hall No. 1; two 8'x8'x9' walk-in coolers also in Mess Hall No. 1; three ½ h.p. air cooled self-contained water coolers, one in each of three wings of Mess Hall No. 1; seven 6 cu. ft. domestic refrigerators in

hospital diet kitchens; and four refrigerated semi-trailers with gasoline driven condensing units.

Service on the refrigerating equipment in the PX, the mess hall and the diet kitchens was routine, involving only occasional adjustment, thanks to Walter Lutz who had been able to keep them operating properly.

The three ½ h.p. water coolers, however, presented a more difficult problem. All drinking water was hauled in by tank truck from a nearby village, where after removal from the wells the water was boiled. From the tank trucks the water was emptied into an underground tank, pumped to an overhead pressure tank through a purifier, and then to the water coolers at an average temperature of 80°F.

Since these were the only water coolers at the base and 2500 men attempted to satisfy their thirst during each one and one-half hour meal time (plus filling jugs, bottles, canteens, etc.), it is obvious that during each meal one of us had to stand by each cooler to "nurse" it along, and attempt to prevent unthinking waste of water.

When it became obvious that the self-contained coolers didn't have a chance, we decided to make remote installations, installing the condensing units outside the building under a "lean-to." The "lean-to" provided pro-

Refrigeration equipment in this mess hall consisted of two walk-in coolers, a 30 cu. ft. reach-in cabinet and three ½ HP air-cooled, self-contained water coolers.

tection from the estimated 45 inches of rain which fell from the middle of June to the middle of September each year almost as regular as clock work. This made a decided improvement in water cooling capacity and carried the load until given some real relief by two additional water coolers when Mess Hall No. 2 was put into service.

Three of the refrigerated semi-trailers were used at Mess No. 1 for chilling and storage of the freshly slaughtered native beef, the quality and texture of which were referred to in language not befitting this article (but which improved our impression of our common beast of burden).

Each semi-trailer was equipped with two separate refrigerating systems, manually started but automatically stopped by pressure controls, each finned tube, wall type blower unit being connected to its individual condensing unit.

Because of the unusual service load of the freshly slaughtered beef, plus almost constant service by the meat cutters when preparing for meals, the blowers were continually frosting up until the fins were blocked.

When this condition was found, we shut down one of the two machines and defrosted the blower with a blow torch and put it back into operation with a minimum of delay. This turned out to be almost a continuous process. We kept going from one unit to the other in order to keep temperatures down to around 35°F.

Daytime Service

The fourth semi-trailer was used at the PX for cooling ale, one quart of which was issued under ration to each man each Tuesday, Thursday and Saturday night. Since the service load was sub-normal on this trailer, it caused no trouble other than normal mechanical failures.

When the PX was enlarged, the contractor installed two 5-gallon (5 h.p.) ice cream freezers and four self-contained storage cabinet, having a total capacity of 120 gallons. When the installation was completed and turned over to us to put into operation, it was discovered that one of the 5 h.p. freezer motors was missing, so we couldn't operate this unit.

We started the other freezer and it operated fine during the day—but at



night, when all the lights were on, the voltage dropped so low that the starter relays would cut out and, unless one of us could be found, ice cream production was suspended until the following morning.

This resulted in a serious personnel problem, because ice cream was one food which was of high quality and had a very satisfying effect upon the men who were generally disgusted with "mass prepared, limited variety food." This was evidenced by the fact that the entire supply of 120 gallons was sold and consumed in the two hours after being placed on sale at 6:00 P.M. daily. After a few failures and "ice-creamless" days, one of us stayed with the equipment at all hours of the day and night to make certain the equipment was kept in operation.

Another interesting project was the installation of a fairly modern Italian make 5x5 double ammonia compressor as a booster in a cold storage plant at Massawa (the sea port), where the normal summer daytime temperature is about 135° F. and the humidity is terrific. The extra capacity was required to reduce the temperature of one room rented to Douglas for the storage of a large shipment of frozen foods anticipated from the U.S.A. (Unfortunately, after all these preparations and the whetting of our appetites for some real food, the boat was sunk enroute.)

The main compressor on this plant was a horizontal two-stage ammonia compressor of Italian manufacture, of a vintage of about 1900. The stuffing box leaked continuously. Even with a native laborer with nothing else to do but tighten the stuffing if it leaked too badly and loosen it if it got too hot, it still leaked. (The last thing we noticed before leaving Massawa for our base was the native standing over the stuffing . . . but he's probably still

standing over it there.)

About this time Mess Hall No. 2 was completed. The two water coolers previously mentioned were put into operation, and two additional walk-in cooler jobs were turned over to us to operate and maintain.

During this time the contractor finished erecting the main cold storage building at the base. However, by this time the contractors had no refrigeration men available to install the equipment, so we were "loaned" to the contractor by Douglas for the job.

The building was divided into six refrigerated compartments, a machine room, commissary, personnel office, and an egg candling room. The machine room is illustrated (this could be clearer, but a retake would now be difficult).

There were four 25 h.p. Freon condensing units, interconnected in sets of two, each compressor having a pressure control and each set being equipped with an oil separator, and an evaporative condenser.

One set of condensing units was for operation of the meat storage room at 34° F., dairy room at 40° F., and vegetable room and two anti-rooms (one on each side, the full length of the building) at about 50° F. Temperature control was by thermostat-solenoid valve combination. Each of the five rooms was equipped with two direct expansion brine spray units, the suction line of each unit being equipped with constant pressure valves.

The other set of condensing units was connected to four similar brine spray units in the low temperature storage room, which was designed for a temperature of 0° F. to -10° F.

Continued on page 40



THE MANPOWER SITUATION

**A Report to the
Refrigeration Industry**

W. RAY KROMER
*Director of National Refrigeration
Service Council and Consultant to War
Manpower Commission.*



THE National Refrigeration War Council was organized shortly after the declaration of war to represent the industry in coping with the national problems created as a result of the war emergency. It soon became evident that the acute manpower shortage existing throughout the industry was one of the most urgent problems for their consideration.

The first action taken was an attempt to hold the remaining skilled mechanics employed in the industry by delaying further Selective Service withdrawals. With the assistance of the Office of Civilian Requirements special recognition was obtained from the national headquarters of Selective Service. As a result, General Hershey instructed all draft boards, in a special telegram sent out in July of last year, to give careful consideration (for a three month period) to requests for deferment of refrigeration repairmen.

Replacements

The War Manpower Commission also recognized the importance of the problem by placing refrigeration re-

pair occupations on the list of Critical Occupations.

While the action of Selective Service retarded the loss of skilled men, it in no way assisted in replacing the manpower already withdrawn from the industry. Since skilled refrigeration mechanics were not available, the immediate problem before the industry therefore, was: (1) recruitment and training of additional manpower required; (2) upgrading the existing working force through organized training.

The Office of Civilian Requirements also cooperated in presenting the case to the War Labor Board and the Office of Price Administration for authorization to increase wages and prices, in order to insure the retention of present personnel, and to meet the competition of other essential industries on a more equitable basis in recruiting additional workers. As yet, no final action on these has been possible on a national basis.

Manpower Committee

The magnitude of the manpower problem was so great that the War

Manpower Commission agreed to assist in the development and administration of a training program, and requested assistance from the industry through the National Refrigeration War Council. It was decided to appoint a special task committee to develop a nationwide manpower program, and place it into operation as quickly as possible. This committee is known as the National Refrigeration Service Manpower Committee.

The committee selected W. R. Kromer, Cleveland, as industry representative to serve as the National Director of the program. The Bureau of Training of the War Manpower Commission immediately appointed the National Director as Consultant to the Bureau to advise on the execution of the training aspects of the program. The special training services of the four agencies affiliated with the Bureau of Training have been made available to the refrigeration industry through this training program.

Mr. Kromer devised a national plan of organization and designed a na-

tional course of study that was accepted by the committee and the War Manpower Commission. This entire plan was printed and ready for distribution the first week in January.

Arrangements were made with the government agencies in Washington to cooperate in the organization, training, and procurement of manpower as well as to cope with the related manpower problems which affect the training program.

Local Committees

Whenever manpower problems in the refrigeration service industry were evident a competent coordinator was appointed from the local power company, a parts jobber's organization, or a leader in the service industry in that community. This coordinator, following instructions from the Director's office, calls a meeting of all refrigeration service agencies, dealers, distributors, parts jobbers, motor repair shops, and other men from related industries.

This group is advised of the opportunity afforded in organizing an emergency council in their community; that arrangements with the War Manpower Commission and U.S. Employment Service have been made for procurement of trainees and instructions to their local representatives to cooperate with the coordinator and officers of the local council in following through with the national plan. Through the Director of the local War Manpower Commission contacts are made for the offices of the local council with the local office of the U. S. Department of Education, U. S. Employment Service, War Labor Board, Office of Price Administration, Selective Service, and War Production Board.

The U. S. Department of Education has advised each state director that funds are available for this program to supply textbooks, pay instructors, supply necessary materials and training facilities.

The U. S. Employment Service has advised its field offices that refrigeration repair service is to be given special consideration in procurement of trainees and to receive the benefits of the Critical Occupation classification. Advertising for trainees in many cases is being done at the expense of the local U. S. Employment Service office.

The War Labor Board has advised its field offices to give special con-

As of March 28, coordinators and local councils were active in the communities shown below.

Areas in which coordinators and local councils are active:

Alabama:
Anniston Training School
Birmingham . . . Training School
Arizona:
Tucson Training School
California:
Los Angeles . . . Training School
Oakland and
San Francisco
Colorado:
Denver Training School
Connecticut:
Bridgeport
Bristol Training School
Hartford Training School
New Britain
Waterbury . . . Training School
Florida:
Pensacola
Idaho:
Boise Training School
Illinois:
Ottawa
Chicago Training School
Indiana:
Evansville Training School
Indianapolis . . . Training School
Iowa:
Dubuque
Kansas:
Wichita Training School
Louisiana:
Monroe
New Orleans . . . Training School
Massachusetts:
Worcester
Michigan:
Detroit Training School
Grand Rapids
Minnesota:
Duluth
Minneapolis
Missouri:
Lebanon Training School
Kansas City . . . Training School
St. Joseph Training School
St. Louis Training School
Nebraska:
Omaha

New Jersey:
Asbury Park . . . Training School
Newark Training School
New Mexico:
Santa Fe Training School
New York:
Lockport Training School
Middletown
New York City . Training Schools
Rochester
Rome
Syracuse Training Schools
Sneetady Training School
Ohio:
Cincinnati
Columbus
Cleveland Training School
Dayton Training School
Toledo
Youngstown . . . Training School
Oklahoma:
Oklahoma City
Tulsa Training School
Pennsylvania:
Allentown
Kingston and
Wilkes-Barre
Reading Training School
Towanda
South Carolina:
Charleston . . . Training School
Tennessee:
Chattanooga . . . Training School
Memphis
Johnson City . . Training School
Texas:
Beaumont
Dallas Training School
Houston Training School
Waco Training School
Tyler Training School
Utah:
Salt Lake City
Ogden
Logan
Provo
Price
Washington:
Spokane
Washington, D. C.: Training School
Wisconsin:
Fond du Lac
Janesville Training School
Madison Training School
Milwaukee
Sheboygan . . . Training School

sideration to applications for increases in wages of existing men, and increase of wages in trainees, where competition of higher wages interferes with the procurement of trainees and where wages of existing men are frozen at a level where it does not lend itself to satisfactory working conditions.

The Office of Price Administration has advised its field offices to give special consideration to applications for increase in prices charged for service, when frozen at a level that does not permit the increased wages necessary to procure qualified trainees.

The War Production Board has advised its field offices to give special consideration to the local organization in its request for release on parts and supplies.

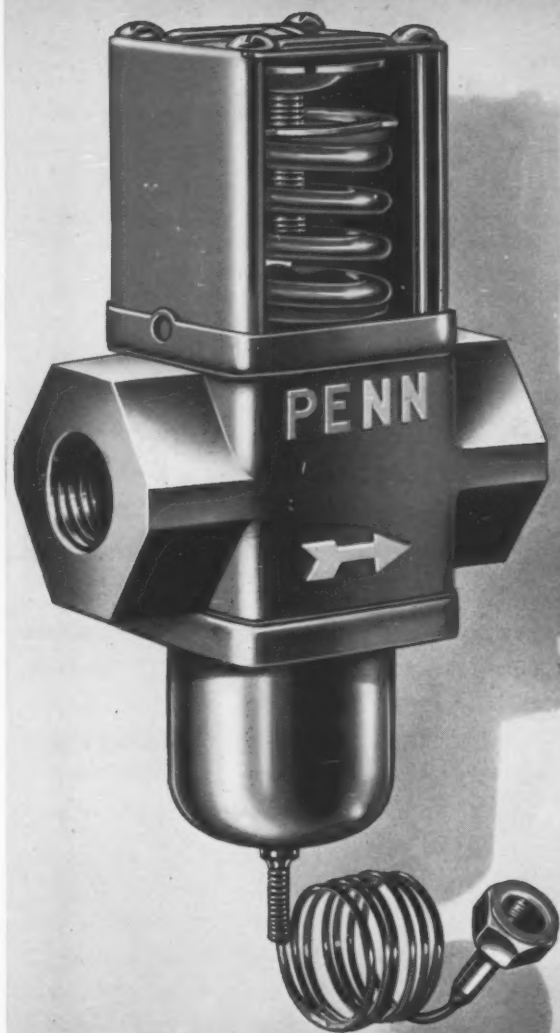
Each local council has four active committees: Selective Service, Wages and Hours, Procurement and Training, and Parts and Priorities. Each committee, with the assistance of the coordinator, considers all problems of each individual member of the local council and contacts its respective government agency in solving these problems.

The Selective Service Committee, for instance, advises each member as to the correct continuity and request for deferment of competent men and assists in appeals to local draft boards, carries it to the state director if necessary, and contacts Washington on any case that cannot be satisfactorily handled through the local board

Continued on page 41

Your Post War **VALVE**

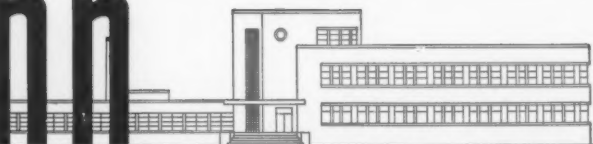
IS HERE TODAY!



- ★ Eliminates sticking of seats
- ★ Eliminates water hammer
- ★ Eliminates drain plug
- ★ Eliminates rusting of range spring
- ★ Eliminates need for lubrication
- ★ Eliminates corrosion of and sedimentation on sliding parts

● Never before have such outstanding features been available...because never before was there a water regulator like the Penn Series 246. It's new...it's different...it's more efficient and more dependable over a longer period for all refrigeration applications. Get all the facts on this new water regulator which will be available soon...write for Bulletin R-1986. Penn Electric Switch Co., Gosben, Ind. In Canada: Powerlite Devices, Ltd., Toronto, Ont.

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

An automatic locker-plant operation in the town of Salem, Ohio, with a population of 15,000. The surrounding area is largely agricultural.



PUSH A BUTTON....

OUTSIDE, the plant is an attractive, smart tile structure, measuring 35' x 70'. It looks clean and efficient.

You walk in the doors, and there in front of you are four lockers—two each on two tiers (one tier is 4 feet above the floor level and the other 4 feet below). You reach each of these tiers by a set of stairs. You, as the renter of a locker, walk up to one of the banks, set the dial at the number of your locker, and press a button. A red light appears, there is a slight rumbling noise, and when the red light goes off, there in front of you is the bank with your locker. You don't go into a cold room to get to it.

You stand in normal room temperature, protected from drafts by an airlock of rubber flap gaskets which seals the perimeter of the locker section, (and prevents air losses from the refrigerated room). When the door is closed, the gaskets pull away from the locker section automatically (preventing wear on the mechanism and noise when the next customer uses it).

Each of the tiers has two banks of 220 lockers. There is an individual automatic mechanism and a separate door provided for each bank. The 480 lockers each measure 36" wide, 2' deep, and 1' high, and are rated at a 225-250 pound capacity.

This is what the customer sees upon entering the plant—2 tiers containing 2 banks each (1 bank is shown open); 480 customers are serviced.

The automatic operation is based on a conveyor system operating a 12" U channel, which forms the backbone of each bank of lockers. Each of the sections—six high—is mounted on a heavy steel plate which is attached to the roller-chain conveyor. A micro-limit switch controls the movement of the rollers. This is the only control within the refrigerated area. Power comes from a 3-H.P., 3-phase motor operating on 220 volts, 60 cycles.

The management of the locker plant claims that far and away the most im-

portant point in this conveyor-type installation is that it requires about 40% less actual refrigerated space than the usual walk-in type plant. The height from the floor to the air duct is only 7' 3" (compared to the usual 12½' height); and refrigeration economy is also effected by eliminating body heat loads and the load added by burning electric bulbs. Without the problem of accumulation, and removal of frosting, the maintenance man's work is much reduced.





The customer selects her bank and her locker location and presses a button. A red light appears while her space is moving to the proper position.

It has been computed that this Salem plant has a 12,744 B.t.u. loss per hour as against a loss in excess of 30,900 B.t.u. per hour in the walk-in type plant of the same capacity. Another claim of the management is that six cubic feet of locker space are rentable in nine cubic feet of refrigerated space (the walk-in refrigerated space, he says, requires approximately three refrigerated feet for each rentable foot).

Temperature is standardized throughout the refrigerated room because forced air circulation is possible, since humans do not enter the locker room. A cold diffuser for



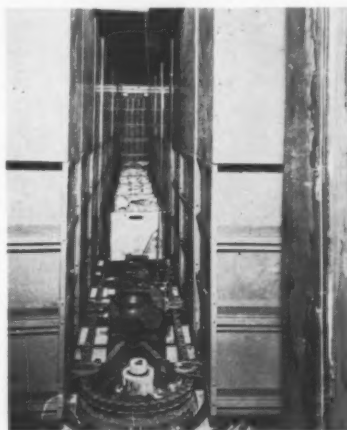
The red light disappears and the customer can then open the main bank door. Seals between the door and the refrigerated space eliminate drafts, heat leak, frosting.

forced air circulation is located in a cabinet adjoining the rear of the refrigerated room. There is a fin-type coil rated at 2200 B.t.u. which gives

a complete change of air through the blower twice a minute at 4200 c.f.m. (the motor is 3-phase, 1 H.P., 220 volts—burning 7.5 amp. at 1725 r.p.m.)

The water-cooled compressor is powered by a 5 H.P. motor and delivers 5 tons. Air is discharged through two ducts—each handling one upper and one lower bank with six outlets. Temperature is held at zero to -5° in the locker-room proper, and a hot-gas defrosting is automatically motivated by a clock, every twelve hours.

Of course the customer does not appreciate many of these details, but the locker-plant operator is aware that all refrigerating equipment is regulated by temperature controls (a large con-



This is a view of the internal mechanism of the automatic conveyor system. A pair of banks is removed for the photographer (heat loss because of this accounts for the slight frosting of the main pinion).

trol board in the workroom provides centralized supervision over all electric lines and equipment) and this comparative ease of supervision is an important factor in reducing worry over mechanical difficulty.

The plant handles meat and fowl preparation at the present time. Plans are under way for the addition of another group of banks, and the addition of space for the preparation of vegetables. Provision is made now, however, for the preparation and of smoking of hams, etc.; the preparation of fowl; and for the merchandising of processed food.

Records of Efficiency

The management bases its records of efficiency essentially on the amount of food processed. While the locker rental is of no small consequence, the important profit item in this opera-

tion is the preparation and processing of meat.

The plant has two large fast-freeze cabinets—one each in the rear workroom and the front salesroom (which are convenient to the lockers and the wrapping tables, as well as to the processing space). Each of these cabinets can handle 2600 pounds of merchandise a day at capacity. Temperature in these cabinets is at -20° , with contact freezing plates dropping to -35° . Each has two expansion valves and the unit has nine plates (one has an additional tenth plate for bulk freezing) measuring $22'' \times 72''$. One air-cooled compressor with a 3-H.P. motor is provided for each cabinet.

Adjoining the locker room is the chill and aging room. Doors open into the rear workroom and into the front salesroom. An overhead track for easy movement of large cuts on hooks runs from the loading entrance through the chill and aging room and out into the salesroom where meats can be easily shown to prospective purchasers. Within the room are spurs on the track, so that each cut rolls into its place without handling. Between the spurs, hung with sides and quarters, are Steri-Lamps to give the meat full tenderizing while in the aging process. (The hanging capacity alone is 10,000 lbs. Space is also provided for stacking poultry and smaller cuts).

The chill room is maintained at 36° by two cold diffusers both han-

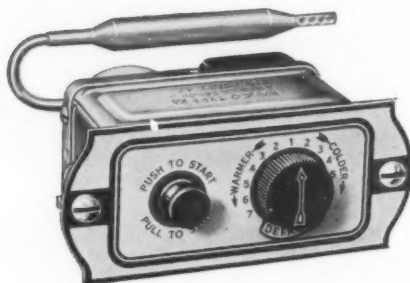


A view of the ham storage and fowl preparation section.

dled in multiple operation by an air-cooled $1\frac{1}{2}$ H.P. compressor which is powered by a motor operating at 1725 r.p.m. These diffusers throw 3000 c.f.m. each when operating. They have fin type coils developing 850 B.t.u. each and adjustable vertical and horizontal louvers. Relative humidity is maintained at about 92%.

Continued on page 39

FORTRESS



Just as the Flying Fortress is "made to take it", so are Ranco Controls. Ranco Controls are built with stainless steel "armor" bases, top frames and side covers, all die-cut in the Ranco plant. Mounting lugs, plates and studs are securely welded into place. When sub-assemblies are mounted on them, the base and top frame are made one solid unit, by spot-welding. The overload heater coil is imbedded in ceramic material, located in exact position in solder well. Throughout Ranco Controls are engineered for long life, as well as for extreme accuracy.

ASK YOUR JOBBER

Ranco Inc.

COLUMBUS 1, OHIO



THE SERVICE MAN'S DEPARTMENT

Here's How, a service man's feature in coming issues, will attempt to pass on to service organizations new ideas and proven procedures that have worked for others.

The last few years have seen the service business advance from a necessary evil to a definite part of the refrigeration industry. Tremendous responsibility has fallen on the shoulder of the service engineer during this war period in maintaining all existing refrigeration equipment, in addition to installing the many new systems in war industries. Your editor requests each service engineer to write briefly on labor and material saving procedures and submit them to this feature so that they can be passed along and utilized by others.

Interchange of ideas relayed in this manner should save many man hours and permit the service men of the industry to cover more territory with the same personnel.

Service Tip. Continued motor trouble may not be caused by defective motors. Make an ammeter and volt meter a part of your service tools. They will show immediately any incorrect voltage and mechanical overloads on the motor. Using these instruments, it may often be possible to determine that the motor is all right and that the compressor needs additional refrigerating oil. Instruments can be bought today that do not require removal of tape at connections to test. Readings can be taken directly from a bridge connection in the safety switch, and another type of instrument requires only that the connections be wrapped around the outside of the insulation on power feeds. As motors are a very critical item, extreme care should be taken to prevent any damage from occurring. It

This section of
The Refrigeration Industry
is edited by
Warren W. Farr
Refrigeration Maintenance
Corporation, Cleveland, Ohio

would be good general practice to test the voltage and amperage on each motor installation after it has been repaired and returned to the job. Readings should be compared to name-plate ratings. Motor repair shops indicate that a tremendous number of motor failures are due to continuous operation at high overloads. It is good practice not to subject a motor to continued operation on voltage 5% below name plate rat-



ing or 10% above. Equip your cars with these instruments and make this check-up a must for the duration.

Send a Picture Illustrating
Your Idea or Procedure and Win
a Prize.

This prize will consist of the new edition of "Modern Gas and Electric Refrigeration" by Althouse and Turnquist. For each picture published, we will send to the contributor this book, which is now being used as the text in the current Refrigeration Industry Training Program.

New Products. Many new sub-zero chambers and cabinets are being installed in the field carrying temperatures from -40° to -125° F. These refrigeration systems are comparatively new to the commercial field. Great care is needed in servicing. These appliances are equipped with two and three stage compressors, new refrigerants, delicate recording controllers and complex piping and wiring arrangements.

Inexperienced mechanics can cause extreme damage to these systems. Manufacturers have taken much care in manufacturing and testing this new equipment. Simple adjustments are usually all that is required to correct difficulties. If you have any specific problems in servicing this sub-zero equipment, direct your problems to this column. If our file does not contain the answers to your problem, men who are experts in this field will supply the solution.

In sending questions, be sure that your data is complete. Include name of manufacturer of high side and low side equipment, type of refrigerant used, and gauge pressure readings. It is the policy of *The Refrigeration Industry* to supply authoritative information on servicing new equipment as rapidly as it is available from manufacturers. Watch these columns and keep up to date.



Degreasing. Repair shop output can be greatly increased if all items are free from dirt and grease prior to the repair operation. Where it is desirable to remove paint, this can also be accom-

plished in the same cleaning process. Degreasing can be accomplished inexpensively in the repair shop by a number of methods.

The first method requires two steel tanks, one containing a hot alkaline solution and the other a clear water wash. After closing all internal openings and removing all electrical devices, the entire device can be immersed first in the alkaline solution and then in the clear water solution. If paint is also to be removed, a paint stripper solution should be included in the alkaline tank and the clear water tank should be heated to approximately 180° F. so that there will be sufficient heat gained in the item being cleaned to evaporate all moisture, thus preventing rusting.

Another practical shop method of

de-greasing is to use one steel tank and a circulating pump with a wire draining rack located midway in the steel tank. In this apparatus, petroleum spirits with a low flash point is circulated over the work, flushing all grease and dirt to the settling chamber of the tank bottom. Care should be taken to keep the inlet to the circulating pump sufficiently removed from the bottom of the tank to provide ample space for dirt and grease to settle. A suitable screen should be placed over the pump inlet to protect it from foreign substances. In place of petroleum spirits, where fire might be a hazard, a number of solutions and solvents are offered to the trade today; however, most non-combustible solutions are considerably more expensive than petroleum spirits.

Should you require more detailed information on degreasing equipment or solutions, direct your inquiry to "Here's How."

Freon 22. R. J. Thompson of Kinetic Chemicals, Inc., recently announced that Freon 22 is now available to users and service organizations for use in equipment designed and built for its use. Deliveries of Freon 22 have been sharply restricted by WPB, particularly for use in new or used system of comfort air conditioning and any installation for storing or dispensing carbonated or malt beverages. This new order is known as M-28A. Primary use of Freon 22 is in the field of low temperature experimental work requiring stratospheric conditions. Low temperature testing is also required for many production methods in connection with the aviation industry. It must be noted that Freon 22 is not a substitute for Freon 12, but is a new refrigerant designed particularly for use where very low temperatures are required.

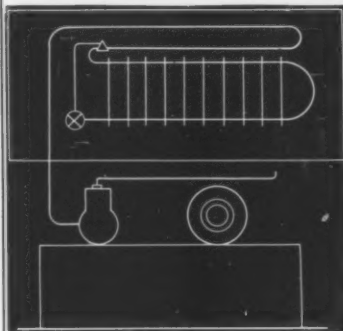
White Elephants. The Cleveland Section of the RSES ran a very successful auction sale on Thursday evening, May 18th. All materials were included in this sale (they were delivered by noon on that day). One of the requirements was that equipment and materials had to be clean and in presentable condition. All sales were for cash, payable before removal from the store and a deposit of 25% of the selling price was paid at the time the sale was made.

All sales were subject to the "rules of sale," announced by a professional

*I do it
this way...*

SERVICE PROBLEMS

IN installing coils or blowers of any description, I normally put in a dryer line of at least 8' or 10' between the outlet of the coil and the point where the expansion valve bulb is clamped to the suction line.



In case there are two coils in series fed from one expansion valve (as in a display case) this dryer line is installed on the last coil only. The use of this allows me to flood the coils, thereby securing maximum efficiency.

J. B. McClean, Philadelphia, Pa.
(If materials situation permits, above dryer coils can be replaced with a heat exchanger. This is desirable due to increase in efficiency. —Edit.)

auctioneer, who was in charge. The cost of selling was established at 15% of the selling price. Surplus materials and equipment, new, renewed, and "as is," were included.

Thermometers. Thermometers become inaccurate due to broken columns of liquid or condensation in the upper part of the column.

To correct this condition, remove glass insert from case and ferrule and pass the bulb end through a flame rapidly, until the liquid column touches the top. The thermometer must be heated carefully after the column reaches the top. Then wave the thermometer in the air to cool. This simple method will recondition inaccurate thermometers.

DALLAS SCHOOL

New night classes in refrigeration have been established at the Mad-
Continued on page 28

*I do it
this way...*

A FEW extra minutes in checking head pressure can save call-backs, cut current costs and protect motors from overload and damage.



No service job is really complete without the use of a head pressure gauge. Test for non-combustible gases, proper water valve settings, high pressure cutout adjustment and leaking discharge valves.

P. Pelot, N. Y. City

The "I Do It's" shown here are contributions from individual service men. "The Refrigeration Industry" pays \$5.00 each for items published. Submit your hint or kink to **THE REFRIGERATION INDUSTRY, 812 Huron Road, Cleveland, 15, Ohio**

**"Brother, am I glad
I have this one!"**



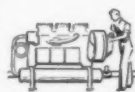
"They sure don't come any better!"

"The tools Uncle Sam gives us to keep his equipment in shape are mighty important. They've got to be able to 'take it'—and boy that's just what Bonney Tools do."

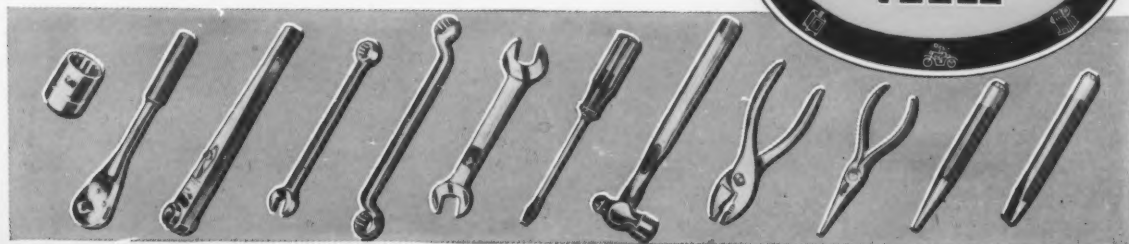


BONNEY FORGE & TOOL WORKS • 711 N. MEADOW ST. • ALLENTOWN, PA.

• "My job of helping to keep refrigeration going here at home is sure tough—



and it's tough on tools too. It takes tools like these that I got with my Bonney Kit to stand up—they're plenty strong and they really fit the nuts and bolts. From here on, brother, it's nothing but Bonney Tools for me."



By Carl C. Vogel

I RECENTLY talked to a grocer who operates a chain of three very modern super markets who took the position that, while he thought there was going to be a great increase in the amount of frozen foods purchased, he did not believe that the growth would be as great as many refrigeration men were wont to believe. He feels that when the food situation gets back to normal the average housewife will not be willing to carry a sizable inventory of food in her basement holding box. He feels that as long as there is an ample supply of fresh food at the corner grocery store Mrs. Housewife will always come into the store to get it.

On the other hand, in talking to a frozen food man his feeling is that Mrs. Housewife has now had somewhat of an education in the use and purchase of frozen foods and that this is just the start of the avalanche which will change the marketing habits of the nation. His contention is that the housewife now knows that the high quality of frozen foods so far surpasses the average run of fresh foods she can get in her daily trips to the store that she will be inclined to tend more and more to frozen foods as a normal part of her family purchases. He points out that superior quality, lower prices and more convenience in marketing, plus the advantage of being able to give her family ANY fruit or vegetable at ANY time of the year, enable her to serve out-of-season foods at in-season prices.

Meanwhile there is a development



This is a food dispenser—a customer makes a purchase.

One of the two 1 HP, 4-cycle, Marine type gasoline driven, compressor motors sliding into its compartment. Easily accessible for cleaning and servicing, the unit, like an out-board motor, is started by means of a pull rope.



A New Kind of O

Is the refrigeration dealer of foods grocer? Is the grocer of tion dealer? Major changes co

just outside Chicago that straddles the refrigeration dealer-grocer argument. It is noteworthy in that this may be the pattern for a major future development and it is certainly one which cannot be passed off lightly.

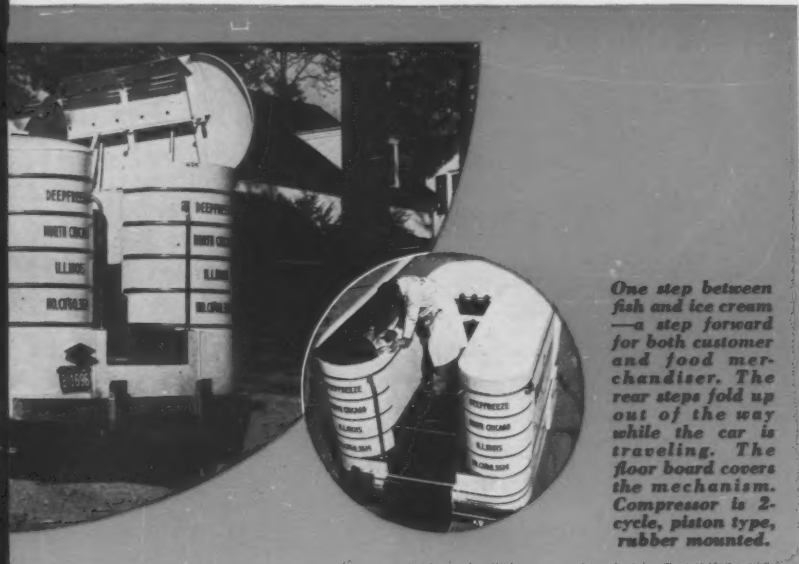
The unique establishment, owned and operated by Hubbard Woods Deepfreeze Sales, Inc., is successor to the food service department of the Deepfreeze Division of Motor Products Corporation, which was conducted through several years of pioneering, out of the factory in North Chicago. Here, under the supervision of Willard L. Morrison, inventor and general manager of Deepfreeze, a frozen food business was born which flourished and grew until it had demonstrated the need for an entirely new type of retail food service for the owners of frozen food cabinets. At this point it attracted the attention of William W. Welsh, Chicago investment banker, president of the LaSalle Street firm of Welsh and Green, Inc. After conducting a searching investi-

gation into future opportunities in the frozen food industry, Mr. Welsh bought out Motor Products' food interests and set about the organization of a distribution system which, after the war, will become a national food procurement agency for Deepfreeze distributors and dealers.

Proving Plant to Start

The Hubbard Woods Establishment, located at 930 Linden Avenue in the heart of the shopping district, operates two Deepfreeze delivery trucks and serves more than 1,200 freezer owners located in Chicago's north shore suburban area. Its war-time function will be that of a pilot plant where methods of preparing and cooking frozen foods will be tested and proved. Miss Elaine R. Bitter, formerly chief dietitian for the State of Ohio, has been engaged to assist in this work.

A unique principle of aging meats has been patented by one of Chicago's largest meat packing plants, the object



One step between fish and ice cream—a step forward for both customer and food merchandiser. The rear steps fold up out of the way while the car is traveling. The floor board covers the mechanism. Compressor is 2-cycle, piston type, rubber mounted.

CABINET MEMBER

morrow going to be a frozen
morrow going to be a refrigerator
be expected in the near future.

of which is to obtain a product of superior flavor and tenderness.

The original unit, licensed under these patents, was designed by Charles G. Minor, well known engineer, associated with Mr. Welsh, and installed in a specially built air conditioned cooler. These aging racks are sealed under glass through which may be seen the various kinds and cuts of meat being treated by the new process. Accurate means of controlling temperatures and humidity are provided to assure uniform treatment. This process will materially reduce the customary time required for aging meats and also the loss of weight in shrinkage.

Direct to Home

"For the duration our activities will be limited to providing a specialized food service for North Shore freezer owners," Mr. Welsh commented. "Ninety per cent of our volume will be through deliveries by our trucks direct to the home.

"We are convinced that our plan of operation will bring about a number of improvements in the retail distribution of food," continued Mr. Welsh. "Once a month service by our trucks to freezer owners will cut delivery costs and save the housewife's time. Our extensive buying facilities enable us to control quality. Our home economics research department will enable us to develop new and improved methods of cooking and serving frozen foods. All of the advantages and information we develop will be passed on to our customers.

"We want everybody to enjoy the advantages of a freezer in reducing food costs and simplifying living problems. We will also offer a frozen food procurement and a tested merchandising procedure to other distributors and dealers throughout the United States."

Mr. Welsh is president of Deepfreeze Distributors, Inc., a recently organized corporation, which has taken over the distribution of Deep-

Here's the main aisle of the store, looking toward the front.

freeze in Cook and 16 adjacent counties in northwestern Illinois. Lake County, Indiana, is also included in their territory. Hubbard Woods Deepfreeze Sales, Inc., is a subsidiary retail dealership.

The monetary success of the development and the general acceptance of this method of food distribution are such that it is more than a passing "stunt." Men all over America are watching this new business with an eagle eye. There is so much capital around loose just waiting for a chance to get into something new, different and yet basic, that there are already murmurings of large developments in the offing.

Unique Store Layout

The Hubbard Woods plant is a radical departure from the conventional food store. There are no counters, show cases or shelves. In their place are two batteries of 26 Deepfreeze cylinders, 13 on each side of a slightly elevated runway, for the use of the sales attendants. While shopping in the store, customers may, if they are so disposed, rest comfortably in wicker chairs, placed in a reception section forward, near the entrance. On the left-hand side of a center aisle leading to the rear, is a railed-in area for the use of the manager, R. E. Nagler, and the accounting department. Carload supplies of frozen meats, fruits and vegetables are kept at sub-zero temperature in the basement. This section is chilled by cylindrical evaporators. Eleven one horse-power compressors are housed in a special ventilated room, six of which chill the basement, four the main floor cylinders, and one the meat cooler.



Annual Award to Detroit Lubricator Co.

DURING the recent Manufacturers-Jobbers' meeting, held in Chicago on April 24th and 25th, President Harry Alter of the National Refrigeration Supply Jobbers' Association, presented a new annual cup award to the Detroit Lubricator Co. Mr. Joe Krall of that company received the presentation for the company. The cup is to be awarded each year by the Jobbers' Association to the manu-

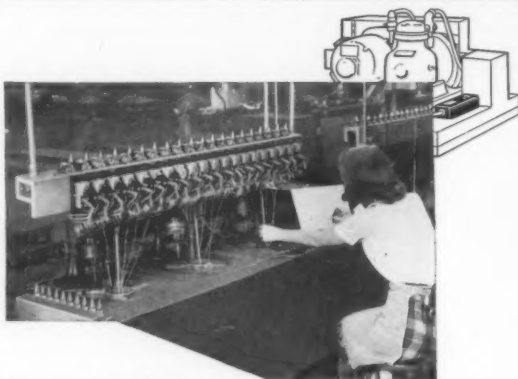
facturer voted by the Jobbers' Association membership to have made the greatest contribution to jobber success each year. Any manufacturer receiving the cup award three times will retain permanent ownership.

This award is a part of the newly developed program of the Jobbers' Association's, Manufacturer's Relations Committee, originally outlined by Mr. H. W. Small, chairman of this

committee, at the Fall meeting at French Lick Springs in October, 1943. In addition to the annual cup award, the Manufacturer's Relations Committee has been considerably broadened in scope.

The National Committee, consisting of H. W. Small, Chairman, and

LEAVING NOTHING TO CHANCE



One of the many ways in which
White-Rodgers assures you that
every control will perform as promised.

8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action Principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. Diaphragm motion uniform per degree of temperature change.
4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.



Part of the final check of every White-Rodgers temperature control is the cold bath immersion test. Here, in constantly circulating fluid of predetermined temperature the controls are checked for positive switch contact and reaction to temperature changes. At this stage, too, final adjustment of the dial is made so that the calibration thereafter is always accurate.

This, and other testing equipment, has been operating since the first White-Rodgers Control was built — operating to assure accurate temperature control to you — and to safeguard White-Rodgers' reputation in the heating and refrigeration fields.



**WHITE-RODGERS
ELECTRIC CO.**

CANADIAN AGENTS:
PRESTON PHIPPS, INC., Montreal, Quebec
A. D. PORTER ASSOCIATED, Toronto, Ontario
FLECK BROS., LIMITED, Vancouver, B. C.

1225E Cass Ave.

St. Louis, Mo.

Controls for Heating • Refrigeration • Air-Conditioning



The first inscription on this beautiful cup was dedicated to the Detroit Lubricator Company.

eleven Committee men representing various sections of the entire country. Each committeeman is district chairman and, with two assistant chairmen, hold district meetings with the jobbers in the district to consider different specific tasks assigned to each district. These tasks, decided upon by the National Committee, are worked out to a conclusion by the various district meetings. Under this plan all members of the Association become active in Manufacturers' relations activities and have a voice in the activities of the committee.

NEWARK ENTRY

Blue Ribbon Foods, Newark, N. J., manufacturers of mayonnaise and food salads, has announced its entry into the field of frozen food distribution. Arrangements have been made for cabinets and trucks stopping at retail store outlets.

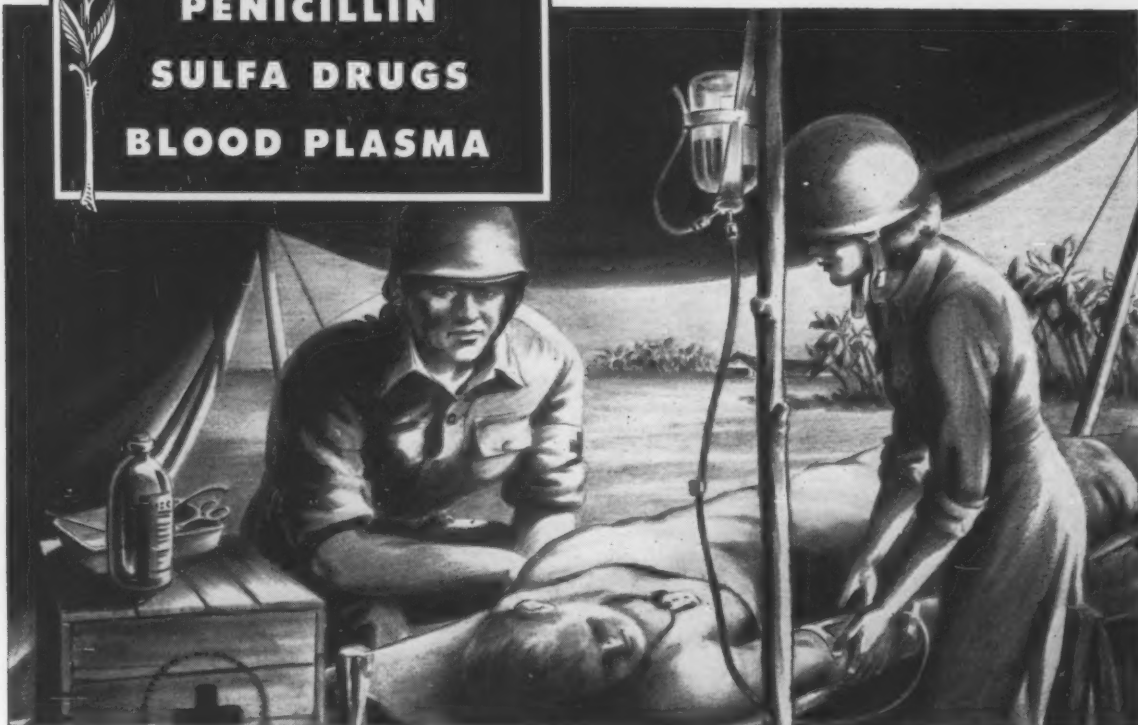
LOCKER ASSOCIATION DATES

The annual convention of the National Food Locker Association is set tentatively for September 25th to 27th at Columbus, Ohio.

THE REFRIGERATION INDUSTRY

Miracles of Medicine

**PENICILLIN
SULFA DRUGS
BLOOD PLASMA**



Many large laboratories recently constructed to manufacture penicillin are equipped with "Detroit" Expansion Valves. In the making of this "miracle of medicine", accurate control of temperature and humidity is essential. There can be no deviation from the optimum conditions. Manufacturers of this equipment choose "Detroit" valves because of their reliable operation observed throughout an association of many years. If you have need of expansion valves, solenoid valves or controls in your present production or in postwar planning, let us work with you on your problems.



Think for a minute what those words mean to a world at war, and what they will mean to a world at peace!

Think of the boys, wounded in action, who are now fighting again to return to their homes and the right to live their lives under the four freedoms.

Think of the blessings and relief from suffering these and as yet undiscovered new drugs will bring to the better world we all hope for.

Then, think that these developments would hardly have been possible without refrigeration and air conditioning.

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT 8, MICHIGAN

Canadian Representatives—Railway and Engineering Specialties Ltd., Montreal, Toronto, Winnipeg

Division of **AMERICAN RADIATOR & Standard Sanitary** CORPORATION

"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • Radiator Valves and Balancing Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves and Refrigeration Accessories • Air Filters • Stationary and Locomotive Lubricators



DALLAS SCHOOL...

Continued from page 22

dox Air Conditioning Company's plant, 724 W. Houston St., Dallas, Texas, according to advice from J. H. Apperson of the Texas Power and Light Co. The program, sponsored by the U. S. Department of Education, with the State Department and U. S. Employment Service cooperating, offers 201 hour courses with a diploma to those who qualify. 39 civilians are enrolled at present. These men are recruited by the U. S. Employment agency in Dallas and represent many walks of life, including a representative from two local chain stores, an ice cream company, tar company, railroad, etc.

FROZEN MATERIALS

Amendment to Priorities Regulation 13 now says that finished products not on List B may be freely sold to any producer or to a wholesaler whose regular business is selling that sort of product either to industrial users or to other distributors for resale. Furthermore, if a holder has a total of not more than \$100 worth of the particular finished product he

wants to sell, he may sell it freely to anyone. When deciding if he has \$100 worth, he must count all products of the same type and style. For example, all wrenches, or chairs or ash cans. This does not mean that he may sell freely separate lots of less than \$100 if he has more than that amount. He may only make such sale if all that he has of that product is worth \$100 or less.

JOBBER MEET

Jobbers located in Western Pennsylvania, Ohio, West Virginia, Western New York, Kentucky and Indiana held a meeting in Columbus, Ohio, on Thursday, May 11th, to discuss the formation of a regional association group. This regional group activity was open to non-members, as well as members, of the National Association. The meeting was sponsored by Jas. H. Downes of Refrigeration Supply Distributors, Cleveland, and H. S. McCloud, Williams & Co., Inc., Pittsburgh. Similar group activities exist throughout the country, namely New England, New York, Middle Atlantic, Southeast Atlantic, Chicago, Midwestern and West Coast groups. Except for the Southwest, this com-

pletes the formation of all group area associations.

*I do it
this way...*

IT is very important, in installing freezer cabinets for ice cream or frozen food, to use the proper oil in the compressor. To be safe, always use the lightest grade (lowest viscosity) specified for the temperature range. Under no circumstances use oil designed for operation at high temperatures. (It should be noted that various refrigerants have differing diluting effects on the oil and, therefore, it is necessary to consider this when selecting the oil).

Never use anything but refrigerant oil in freezer installations (otherwise there would be the danger of plugging up the coils or plates, as well as the danger of impurities sticking up the compressor). When using sulphur dioxide, I use an oil with a viscosity of no more than 75 (not true in all SO₂ installations. For example, the Norge Rollator. Watch Manufacturer's Specs—Edit.)

C. T. Mott, Philadelphia

SUPERIOR QUALITY FITTINGS

... designed especially for use in refrigerating systems where they must withstand wide fluctuations in temperature, plus considerable vibration. Machined from brass forgings and relief-annealed extruded brass rod to assure uniform density—maximum strength—freedom from season cracking—total absence of seepage leaks.

All threads machined to medium fit (SAE Class 3). Flare threads and faces protected by cardboard ferrules.

SUPERIOR QUALITY FITTINGS are recommended for, and used extensively by refrigeration, machine tool, marine, refining, liquefied petroleum gas, and many other industries.

• If you haven't a copy of Catalog R2, Request one today

SUPERIOR VALVE & FITTINGS COMPANY

PITTSBURGH 26, PENNSYLVANIA

Offices in Principal Cities • West Coast Stock: Los Angeles (15) • Jobbers Everywhere

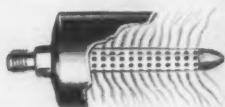
No. 102

DESIGN..
... MAKES THIS REFILLABLE
DEHYDRATOR MORE EFFICIENT

This product is available under L-126.



Cross section of Type 743 Henry Dehydrator.



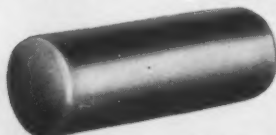
Greater Efficiency Because of Patented Dispersion Tube. Entire volume of the dehydrant is exposed to penetration by refrigerant.



Strainer Tube Can Be Easily Cleaned or Replaced. The reinforced monel strainer tube is silver soldered to the outlet fitting eliminating by-passing of the refrigerant.



Abso-Dry Pressure Sealing Process. Loosening of seal cap prior to installation produces hissing sound due to escape of dehydrated air indicating that dehydrant is absolutely dry.



One Piece Drawn Brass Shell. Type 743 Dehydrators in the 6" length are drawn in dies so that they have only one joint—larger sizes have soldered end caps at both ends.

Easy to clean! Easy to restore to original efficiency by merely replacing the dehydrant! These are your first reactions when you remember field problems encountered in servicing Refrigeration and Air Conditioning installations. Apart from the refillable feature, however, Type 743 Henry Dehydrator should be the choice of anyone interested in more efficient removal of moisture in a system. This is because many of the standard Henry features of design and construction that have made Henry Dehydrators the choice of the Industry are incorporated in this refillable dehydrator. You will find these features described in detail on the left.

Type 743 Refillable Dehydrator is available in a series of sizes and capacities that will take care of the majority of commercial installations. Best of all, the unit is so reasonably priced that it will pay any service or contracting organization to use it as standard equipment.



HENRY VALVE CO.

3260 WEST GRAND AVENUE, CHICAGO 51, ILLINOIS
PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

APPROVED FOR NAVY, MARITIME COMMISSION AND ARMY USE

C A M E R A



1. A group of NRSJA directors: *Geo. J. Roche*, Parks & Hull Appliance Corp., Baltimore, Md.; *Harold G. Stern*, Refrigerative Supply, Inc., Seattle, Wash.; *Harry Alter*, Harry Alter Co., Chicago, Ill.; *Fred B. Hovey*, Secretary, NRSJA, Chicago, Ill.; *H. W. Small*, Thermal Co., Inc., St. Paul, Minn.; *Horace W. Blythe*, H. W. Blythe Co., Chicago, Ill.; *A. H. Holcombe, Jr.*, Victor Sales & Supply Co., Philadelphia, Pa.; *Harold R. McCombs*, McCombs Refrigeration Supply Co., Denver, Colo.
2. Some of the ladies who were at the convention: *Mrs. Frank Langsenkamp, Jr.*, Indianapolis, Ind.; *Mrs. Frank R. Pond*, Minneapolis, Minn.; *Mrs. H. W. Small*, St. Paul, Minn.; *Miss Hazel McQuiston*, Memphis, Tenn.; *Mrs. Robert Gennett*, Birmingham, Ala.
3. Some more of the ladies and another informal shot of those seen in No. 2: *Miss McQuiston*, above; *Mrs. Gennett*, above; *Mrs. H. W. Holt*, Pittsburgh, Pa.; *Mrs. J. Strachan*, Cleveland, Ohio; *Mrs. L. J. Pool*, Grand Rapids, Mich.; *Mrs. Alex Holcombe, Jr.*, Philadelphia, Pa.
4. Drinking "cokes": *C. Cunningham*, Refrigeration Supplies Co., London, Ontario, Canada; *Bert Payton* of the same company; *Gus Larson*, Gustave A. Larson Co., Milwaukee, Wis.; *Ken Newcum*, Superior Valve and Fittings Co., Pittsburgh, Pa.; *F. A. M. Dawson*, of the London, Ontario distributorship; *Kurt Rose*, Superior Valve and Fittings Co., Pittsburgh, Pa.
5. *Harry Alter*, President, NRSJA, presents a cup to *Joe W. Krall* of the Detroit Lubricator Co. For details on this see page 26 of this issue.
6. *Herman Goldberg*, Chicago, Ill.; *Frank G. Slagle*, Los Angeles, Cal.
7. *Irving J. Fajans*, Aetna Supply Co., New York City.

The photographs shown on these pages were taken by Irving Alter of The Harry Alter Company, Chicago.

Candid camera shots of the Refrigeration Jobbers and Manufacturers convention held in Chicago in April.

8. A group of REMA directors. Front row—*H. L. Burras*, Theodore R. Sills Co., Chicago, Ill.; *A. B. Schellenberg*, Alco Valve Co., St. Louis, Mo.; *F. J. Hood*, Ansul Chemical Co., Marinette, Wis.; *F. K. Smith*, Tecumseh Products Co., Tecumseh, Mich.; Crouching on the left is the genial secretary of REMA, *R. Kennedy Hanson*. Back row—*R. H. Luscombe*, Penn Electric Switch Co., Goshen, Indiana; *John W. Baillie*, Detroit Lubricator Co., Detroit, Mich.; *J. P. Rainbault*, General Electric Co., Bloomfield, N. J.; *Joe Krall*, Detroit Lubricator Co., Detroit, Mich.
9. A group of Ansul Chemical men: *Leonard C. McKesson*, *H. R. Higley*, *F. J. Hood* and *W. O. Walker*.
10. *Mr. and Mrs. Jim Strachan*, Cleveland Ohio.
11. *Leland Flint*, Leland Flint Distributing Co., Salt Lake City, Utah; *Wyatt Brown*, Wyatt Brown Co., San Francisco, Cal.
12. *Boyd Evans*, Manager, United Refrigerator Supply Co., Memphis, Tenn., and *Harry Alter* of the Harry Alter Co., Chicago, with *George Roche* of Parks and Hull Appliance Corp., Baltimore, in the background.
13. *Earl Vallee*, Automatic Products Co., Milwaukee, Wis.; *A. J. Roche*, Roche International, New York City; *James A. Strachan*, The Weatherhead Co., Cleveland, Ohio.
14. *John Wyllie, Jr.*, Chairman of the Refrigeration Manpower Training Committee, (and with Temprite Products Corp., Detroit) and *Ray Kromer*, National Chairman Refrigeration Manpower Training Committee, Cleveland, Ohio.
15. *Gilbert May*, Senior Analyst, Plumbing, Heating and Refrigeration Supplies, War Production Board, Washington, D. C., with *Sterling Smith*, Refrigeration and Air Conditioning Section, War Production Board.



ABOUT PEOPLE—

NEW REMA OFFICERS

New officers of the Refrigeration Equipment Manufacturers Association elected during the April meeting include the following: President, A. B. Schellenberg, Alco Valve Company; Vice President, F. J. Hood, Ansul Chemical Company; Secretary, George R. Allen, Mueller Brass Company; Treasurer, J. A. Strachan, Weatherhead Company.

New members of the Board of Directors are: Charles H. Benson, Imperial Brass Manufacturing Company; J. P. Rainbault, General Electric Company, H. F. Spoehrer, Spoehrer-Lange Company, and R. O. White, Day & Night Mfg. Company.

G. M. KINGSLAND

G. M. Kingsland, formerly of the Cleveland office of the Minneapolis Honeywell Regulator Company has been appointed Manager of the new Refrigeration Controls Division. The Assistant Sales Manager of the Division is L. J. Krause.

A. B. NEWTON

A. B. Newton, it is announced, has been appointed Staff Engineer in charge of commercial refrigeration for Airtemp Division, Chrysler Corporation. Mr. Newton goes to Chrysler from the Refrigeration Control Division, Minneapolis Honeywell Regulator Company.

C. T. LAWSON UP

Charles T. Lawson, General Sales Manager of the Kelvinator Division, has been appointed vice president of the Nash-Kelvinator Corporation.

CARL L. WALLFRED

Ansul Chemical Company, Marinette, Wisconsin, announces the appointment of Carl L. Wallfred as Manager of its Pilot Plant Department. Mr. Wallfred, a graduate chemical engineer of the University of Minnesota, formerly was a metallurgist at the Batelle Institute.

O. F. ACHTENHAGEN

O. F. Achtenhagen announces the purchase of the Radio Appliance and Distributing Company of Denver. Mr.

Achtenhagen has been for the past two years general manager of the Philco Training School in Philadelphia. He will keep the company name, take over all assets and occupy the same building.

RUSSELL D. YODER

Cutler-Hammer, Inc., Milwaukee, Wis. announces the establishment of a sales office in Columbus, Ohio. The new office is located in the Chamber of Commerce Building, 30 East Broad Street.

Mr. Russell D. Yoder will be the sales engineer in charge of this new office.

The territory of the new Columbus office includes 25 counties in central and eastern Ohio.

For the present, the Columbus office will operate as a branch of the Cincinnati District Sales Office of which Mr. E. C. Bolton is District Manager.

H. D. ANDRES

The election of H. D. Andres to the position of President of the Cleveland Technical Societies Council has



H. D. Andres, President Cleveland Technical Societies Council 1944-45

been announced. At present Mr. Andres, better known as "Andy" to his friends in the industry, is a partner in the Associated Engineering Company. He formerly was connected with the Vilter Manufacturing Company of Milwaukee as Field Engineer. He is Past Chairman of the

Cleveland Section, American Society of Refrigerating Engineers, and Chairman of the 1943 National A.S.R.E. Spring meeting.

The Cleveland Technical Societies Council is an organization of local chapters or sections of national technical societies. It consists of twenty-six such societies now with an aggregate membership of over 8,000 engineers and architects in Northern Ohio. The opinions of Council have been expressed with effective results on several matters of national concern. In this group, representing many phases of research, there are literally hundreds of nationally known men who are active in the area.

It is significant that a refrigerating engineer has been selected to head this group of technical men and the action indicates a growing realization of the importance and growth of the refrigeration industry.

H. F. CARR

Harold F. Carr has been made Chief of the Electrical and Mechanical Repair Section, Service Trade Division, Office Civilian Requirement, War Production Board.

JOHN A. SCHENK

John A. Schenk has been appointed Application Engineer of the Alco Valve Co., St. Louis. Mr. Schenk has been with Alco since January of 1935.

R. H. METCALF

Ralph H. Metcalf has been named the Zone Supervisor in the Cleveland (Ohio) area for the Air Conditioning Controls Division of the Minneapolis Honeywell Regulator Co. Mr. Metcalf is shifting his headquarters from the St. Louis office.

DR. W. A. PENNINGTON

Carrier Corporation, Syracuse, N. Y., has announced the addition of Dr. William A. Pennington to the research staff of its Engineering Division which is headed by vice-president Herbert L. Laube.

Dr. Pennington will devote himself to Carrier's metallurgical and chemical problems, including a number of research projects connected with the company's preparation of new and redesigned products for the postwar period, the announcement said.

THE REFRIGERATION INDUSTRY

P. M. BRATTEN, H. M. KELLEY

P. M. BRATTEN, General Sales Manager of Frigidaire Division, General Motors Corporation announces the appointment of Harry M. Kelley to the position of Appliance Sales Manager and the return of Paul



H. M. KELLEY

H. Brennan to his former position of Commercial Sales Manager.

Mr. Kelley has served in various important sales capacities in his 12 years at Frigidaire. He was District Sales Manager for four years before coming to the factory as a specialist in the Public Utility Sales Division.



P. M. BRATTEN

Mr. Brennan has been associated with the Frigidaire Commercial Sales Division for over 17 years. Joining the company as a Commercial Sales Engineer, he was National Users and Apartment House Representative for 9 years in New York before coming to Dayton to take charge of Frigidaire's National Users Department. As Manager of Commercial Sales, he has charge of all commercial refrigeration and air conditioning sales.

A Compressor

IS NO BETTER THAN ITS SHAFT SEAL...

We specialize in the making of mechanical seal assemblies for rotating shafts. Our product is the result of years of experiment and study. **ROTARY SEALS**, in addition to being the outstanding choice of service organizations, are also used as original equipment by compressor manufacturers.

In addition to making Rotary Seal Replacement Units for household compressors

WE ALSO MANUFACTURE MANY UNITS For Commercial Compressors

prominent among these being:

Make of Compressor	Shaft Size	Stock No.
BAKER	1 1/4"	9408
BAKER	1-7/16"	17409
BAKER	2 1/4"	22411
BRUNNER	1 1/8"	9375
BRUNNER	1 3/8"	9376
BRUNNER	1 1/4"	9377
BRUNNER	2"	22378
CARRIER	1"	9158
CARRIER	1 1/2"	14159
CARRIER	2 3/8"	22160
CURTIS	1-1/16"	9291
CURTIS	1 1/2"	9284
GENERAL ELECTRIC	2"	17198
GENERAL ELECTRIC	2"	30199
KELVINATOR	1-3/16"	14117
KELVINATOR	1 3/8"	14119
KELVINATOR	1 1/2"	14122
KELVINATOR	1-9/16"	17123
WESTINGHOUSE	1"	6365
WESTINGHOUSE	1 1/4"	9366
WESTINGHOUSE	1 1/4"	17367
WESTINGHOUSE	2"	17364
YORK	3/4"	6223
YORK	3/4"	14222
YORK	1 1/8"	14224
YORK	1 3/4"	30221

Additional units for commercial compressors are listed in our 1944 Replacement Unit Stock List which you can obtain from your jobber.

ROTARY SEAL COMPANY

2020 North Larrabee St. • Chicago 14, Ill.

GAGE PRODUCTION UP

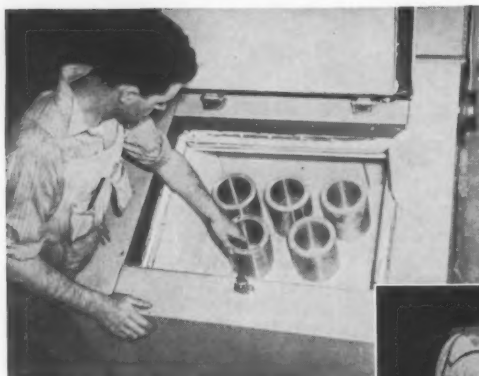


FIG. 1—Looking down into material storage space.

BEFORE the recent developments in sub-zero mechanical refrigeration it was the general practice to season rough finished metal parts by exposing them to the elements for several months. This seasoning process prevented distortion of the finished product to some extent but, in addition to the time element involved, the method was unreliable in that it provided no accurate system of control.

Metallurgists explain that the application of heat or cold to some metal slightly changes the inner structure of the mass or the relative geographical positions of the millions of atoms that make up the mass. In changing the positions of the atoms some of the characteristics of the metal are also changed. In the case of super-cold treatment, for example, some of the metals become harder—and lose all tendencies to distortion.

In the opinion of leading tool and gage makers these precision gages would be of little or no value were it not for refrigeration. All plants engaged in the manufacture of these devices for the machine trade use some form of sub-zero cold treatment, the most popular of which is the mechanical unit.

Refrigerated treatment (or seasoning) boxes, designed for normalizing metals, have working temperatures far lower than any explorer ever dreamed could exist in Little America. When these units are not in use

Uniform standards of measurements through the use of exactly accurate gages has made it practical in numerous instances for such parts to be made in widely separated shops and assembled at a central point.



FIG. 2—Operator removing concentricity gages from sub-zero refrigerator after normalizing treatment of -120°F . Gage setting on top is frosting up because of atmospheric humidity. Photos, Courtesy Tool and Gages Corp. Cleveland, O.

they coast easily along at a mere thirty below zero. As soon as they are loaded with production and the adjustment is turned the temperature begins dropping and in a very short time the thermometer reads -120°F . Some of these units are capable of reaching -160°F .

The present accepted practice is to leave the parts in the extreme temperature of the cold chamber until they are thoroughly saturated. This usually requires from three to ten hours. They are then removed for finishing operations.

The freezing process seasons the metal to the extent that warping and growth tendencies are removed. In other words, after the tool or gage has been treated in the manner described, it will not be subject to warpage, shrinkage, or any other mal-formation beyond the normal co-efficient of expansion and contraction which is a known factor. To compensate for this factor all inspections are made in a controlled temperature room of 68°F .

Modern production gages are accurate to the finest degree, as they are calibrated from standard "Gage Blocks" which are accurate to a tolerance of four millionths of an inch. These blocks have also been seasoned by the cold process to insure their accuracy.

While there are numerous other industrial applications of the cold process probably, at the present time, the most important application is in the making of tools and gages because these are the instruments that make possible and insure the precision and accuracy of every implement or machine that comes off the production line. It is understandable that the slightest degree of distortion in gages would ultimately mean the scrapping of millions of dollars worth of vital parts, the loss of countless man-hours and a waste of valuable material.

High on the list of important uses of the cold process is the treatment of cutting tools. As has been pointed out, it is well established that after metals have been subjected to sub-zero temperatures their hardness has been increased. Conclusive tests have shown that cold treatment has actually doubled the life of such tools as saws, bits, broaches and drills. Transposed into terms of the productive time of each machine, it can be readily seen that the increased life of cutting tools not only increases the efficiency of each machine, but reflects a greater economy of operation, inevitably resulting in higher profits or lower production costs.

The implications of the steady growth and development of cold normalizing and the expansion of its uses indicate definite applications in nearly every class of manufacturing.

While not tremendous, the market should be a steady one, for expanding post war industrial users' retooling programs to take advantage of war-time technological advances.

*At about -100°F . we begin to run into a problem on Freon-12 because of the very low absolute pressure. Most Freon compressors as built today use suction valves that are actuated by a differential in pressure—i.e., flapper valves seated by light spring tension. It takes anywhere from a few ounces to perhaps a pound pressure to permit a reasonable flow of gas into the cylinders. This means that even though we attain a perfect vacuum in the cylinder at the bottom of the stroke, we have only 1.43 lb. total pressure with which to fill the cylinder at -100°F . At -120°F . we have only about .65 lb. total pressure. By designing special mechanically actuated valves, we could overcome this particular problem but the few degrees gained do not seem worth the cost.

Our practical limit on Freon-12, therefore, seems to be around -100° to -110° evaporator temperature, and our volumetric efficiencies are none too good even at that level, because of imperfect filling of the cylinders on the suction stroke. If we go to Freon-22 we can go about 15 degrees lower before this factor becomes critical.—From an A.S.R.E. paper presented before the Baltimore-Washington Section by W. S. Aulsebrook, Asst. Sales Mgr., Electric Refriger. and Air Cond. Div., Servel, Inc., Evansville, Ind.



**CHECK
DOOR GASKETS
ON EVERY JOB!**

Make a habit of checking door gaskets on every refrigerator you repair...you'll earn more money and do a better service job. Worn or deteriorated gaskets cause heat losses ranging up to 9% on a high percentage of used refrigerators, and cost the owners money.

Jarrow Gaskets for all popular makes of refrigerators conform to original specifications...are recognized as the ideal gaskets for replacement.

Your Jobber Has Jarrows In Stock




**Spell
SULFUR DIOXIDE
and
METHYL
CHLORIDE!**

**THAT'S SIMPLE...
A-N-S-U-L**



LIQUID Sulfur Dioxide ANSUL
5, 10, 25, 70, 100 and 150-lb. Cylinders

LIQUID Methyl Chloride ANSUL
3, 6, 15, 40, 60, 90 and 130-lb. Cylinders

Available in carload lots or handy cylinders sized for servicemen's needs.

**ORDERS FILLED PROMPTLY
through your Ansul Jobber.**

ANSUL CHEMICAL COMPANY
MARINETTE, WISCONSIN

Agents for Kinetics' "FREON-12"

*REG. U. S. PAT. OFF.

RI-1-44

ELECTRIMATIC REGULATING VALVES

Automatic control and regulating valves for Freon, Methyl Chloride and Ammonia. A large variety of sizes and types available for practically any refrigeration requirement.



WL water regulating valves for Freon, Methyl, or Sulphur. $\frac{3}{8}$ " orifice and $\frac{3}{8}$ " FPT. Brass body construction. Large capacity—no chatter.

WP water regulating valves are available in $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " FPT sizes. Brass body construction for Freon, Methyl or Sulphur. Easy adjustment.



WK water regulating valves are De Luxe Pilot Operated Modulating valves. Iron body, simple adjustment. Available in sizes ranging from $\frac{3}{4}$ " to 2" FPT.

WR regulating valves for Ammonia are diaphragm operated and highest quality corrosion resistant materials are used. Available in sizes ranging from $\frac{3}{8}$ " to 2" FPT.



Electrimatic valves are individually tested for efficient, economical operation. Trouble free performance.

Ask for a copy of our latest catalog today.

Electrimatic

2100 INDIANA AVENUE
CHICAGO 16, ILL.



Over the COUNTER

Jim: "Golly, what a day!"

Frank: "What's the matter, Jim—did you have a tough day?"

Jim: "Well gosh, Frank—I am thinking of taking a course from Dunninger. He is the only guy I know that can answer all the questions that are thrown at me in a day's time standing at this counter. It is all right to answer questions, but Jehoshaphat!—The guys that come in here certainly expect us counter men to know all the answers. Spend more time answering questions than we do selling merchandise—but I suppose that is all part of the game, so we have to take it. There certainly were some beauts today.

One guy came in who had an expansion valve freeze up on him. He told me he had put in three new dryers—one after the other—but couldn't get rid of the trouble and wanted to know what to do. I told him that no doubt he was getting an excessive moisture condition and he should be sure to use three dehydrators of sufficient capacity. Chances are he hadn't been using the proper size dehydrators.

He couldn't tell me either the size of the equipment or the dehydrators he had used, but from what he said I guessed that he hadn't used large enough dehydrators for the job.

I suggested that he might get rid of his headaches by using Thawzone or Drierite according to the directions outlined by the manufacturers, and then if that didn't work, I told him he ought to completely discharge the system by discharging at the head valve under pressure.

I told him to drain out all of the oil in the crank case and the whole system, and he should tear down the compressor because he probably had some corrosion or copper plating. You can't tell about these things because he didn't know what refrigerant he had been using. I

guess if he replaced all of the defective parts and reassembled them and then baked them for 8 to 10 hours that this might help him, too. I only hope that he can bake them at around 180° because that is about the right heat."

Frank: "Did you tell him to try to bake the coils out, with the compressor if he could?"

Jim: "Yes, I did. Then I told him to reinstall the equipment with a new dehydrator and to put a good grade of oil in the crank case and some new refrigerant in the system. I think this ought to help his trouble. I hope so anyway."

Frank: "Well, I had one today myself. A guy came in here who told me that he had put methyl chloride in a Freon system because he did not have any Freon. He told me he used about four pounds of methyl in a job that normally takes 10 pounds of Freon and now he was having some trouble because the job runs irregularly and frosts back on him. He can't get the switch setting to work right. He wanted to know if he should put in a complete charge of methyl.

"I told him this procedure was perfectly all right if he only watches the other elements on the job. For instance, he might have a compressor that has a lot of aluminum parts in it and, if that is the case, he is going to have a terrific amount of trouble. To most of these fellows, who come in with that same kind of change-over problem, I recommend that they make a complete change-over by putting the Freon still in the system into a service cylinder. Then they can always save it for use on another job, when a small amount of Freon is to be added. I always warn these guys that they ought to change the pulley size in making such a change-over. You got to change to a methyl expansion valve because they might not get the proper orifice and su-

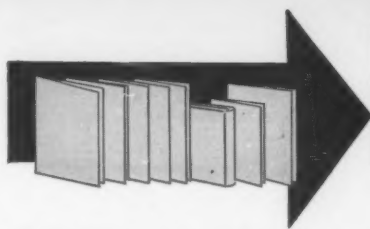
perheat range, otherwise. Some of these fellows have gone 'hog-wild' in adding methyl chloride to Freon and they tell me they have had no bad results, but I feel, when the quantity of methyl chloride to be added runs over 15% or maybe 20%, a complete change-over should be made. As a matter of fact, I'm pretty insistent on this point, because they sure are going to run into trouble if they don't follow this practice. Well, so long, Jim, I'm going home."

Jim: "Say, Frank, before you leave, there was a guy in today who had an interesting question. It seems that he has a low temperature freezing cabinet that uses methyl chloride and he tells me it always needs a lot of oil and wondered how he could overcome this."

Frank: "Does the machine operate on a vacuum?"

Jim: "Yeh! Sure, I know that when a machine operates on a vacuum it tends to suck oil out of the crankcase and circulate it through the system. This happens in a lot of systems, but particularly when there is a vacuum. I told this fellow to be sure to use an oil separator on a job of this kind."

Frank: "The oil in a low temperature box is thick; it congeals and, therefore, gets pretty sluggish. While it must eventually return to the crankcase, you have to use excess oil all the time to get oil in the crankcase. I feel that if a separator is used on the job it usually will get the oil back to where it belongs. Well, goodnight. See you in the morning. Probably there'll be some other nuts to crack tomorrow, but I'm going bowling now."



Useful Literature

The publications featured on this page were written by experts. They are **FREE** publications. To obtain these write to **THE REFRIGERATION INDUSTRY**, 812 Huron Road, Cleveland, 15, Ohio. If there is some delay in receiving the material requested, please understand that this is due to our operating with a minimum staff. We shall put through all requests as rapidly as possible.

1—Large Compressors . . . A presentation on a 2 HP, 4 cylinder, air-cooled compressor for use where water supply is limited. Particularly applicable to soda fountains, dairy coolers, reach-ins, etc. A Lynch Mfg. Corp. release.

2—Valves . . . Removable internal assembly, and diaphragm replacement with full pressure in the valve described in Catalog R-2 by the Superior Valve & Fittings Co.

3—Food Conditioner . . . Basic technical material on control units for walk-in boxes and packaged refrigeration systems. An American Coils Co. release.

4—Frozen Food Design . . . Engineering and design data on valves, oil separators, accumulators and other parts for frozen food cabinets, with coolers, etc. Released by Temprite Products Corp.

5—Regulating Valves . . . Presentation by The Electromatic Corporation on the construction and use of regulating valves to secure proper condensing pressure without waste.

6—Parts Catalog . . . An Imperial Brass Mfg. Company release on products for refrigeration and air conditioning.

7—Dehydrators . . . Illustrative descriptive literature by the Mueller Brass Co. on its line of dehydrators.

8—Expansive Valves . . . A description of the place and use of such valves and of controls in refrigeration production and maintenance by the Detroit Lubricator Co.

9—Silica-Gel . . . Instructions on the use of Silica-Gel in the air conditioning and refrigeration industry. A "How to Do It" pamphlet by the Davison Chemical Co.

10—Thermostatic Expansion Valves . . . Reasons for the selection of various types of valves and controls by the Spoehr-Lange Co.

11—Temperature and Humidity . . . The part that condensing units play in the preservation of food and how the Brunner Manufacturing Co. has fitted their lines to these products.

12—Water regulators . . . A Penn Electric Switch Company discussion on a new valve for numerous applications in the refrigeration field.

13—Calculators . . . A one page sheet issued by the magazine, "Gas" describing a flow calculator for the computation of variables in the transmission of natural gases.

14—Frigidaire at War . . . How the Frigidaire Division of General Motors has transferred its normal production to war time procedure is beautifully illustrated in an employee brochure.

15—Locker Plant Planning . . . A 24 page illustrated booklet on locker plant planning, equipment and building, published by the Amana Society.

16—Heat Insulation . . . A presentation by the Monsanto Chemical Co. on Santocel, a porous silica product used as an insulator.

MAIL THIS COUPON FOR FREE LITERATURE

Refrigeration Industry, 812 Huron Road, Cleveland 15, O.

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\$5.00 is paid for every hint and kink published by The Refrigeration Industry. Send in your short cut and "How To Do It"—this need not be a literary masterpiece. All we want are the facts and, if possible, a drawing which will help to clear up your method of doing jobs more easily, more quickly.

\$\$\$



Solderless Wiring

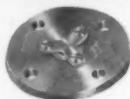
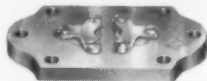
A new method of solderless wiring, instead of the conventional soldering iron, solder and flux, is announced by Aircraft-Marine Products, Inc., Harrisburg, Pa. This method requires only a hand tool, similar to a pair of pliers. The manufacturer claims that a pressure on the handles crimps the end and connection so that a fool-proof connection can be obtained.

Spotwelder Unit

The Airtemp Division, Chrysler Corporation, announces a refrigeration unit made to cool resistance spot welders and for other specialized industrial liquid cooling services. This is a 1½ HP unit, self-contained, and has a hermetically sealed radial compressor, a high pressure cutout, a remote bulb thermostat. The temperature range is from -20° to +20°F.

Valve Plates

A complete new line of valve plates for general replacement use on all makes of refrigerators has been announced by the Chicago Seal Company. The new plates have removable valve seats, which make it possible to replace only worn parts, instead of entire units. The units are taken apart



by removing the screws and pulling the seat out with the fingers. Valve seats are firmly held in position by a retainer bar which is secured to the plate. The new Valve Plates are available in all sizes for replacements on all popular refrigerators.

Hole Cutters

The Robert H. Clark Company of Beverly Hills, Cal. has a new set of three adjustable hole cutters, which cut diameters from 5/8" to 3 1/2". The manufacturer claims that these produce accurate and clean holes with no after-grinding necessary. They can



be used as hand tools; in portable electric and pneumatic drills; or in light drill presses.

Long Range Thermometer

The Taylor Instrument Companies of Rochester, N. Y. have announced their 53K series thermometer for measuring temperatures for installa-



tions that require long tubing between the bulb and the instrument. This is available in a wide variety of standard temperature-sensitive bulb constructions and in ten ranges, the lowest being 40° F. to 120°, and the highest, 400° to 900°.

ZERO POINTS

As a result of the elimination of point values on most meat cuts there has been an acceleration of the storage of frozen meat in anticipation of the reestablishment of point values on most cuts. A review of 96 locker plants shows this trend sharply up in the latter part of May. Meanwhile

VIRGINIA REFRIGERANTS

—"SULFUR"

—"METHYL"

—"METHYLENE"

*Tested Purity
for
Service Surety*

AGENTS FOR KINETIC'S
"FREON-12" and "FREON-22"

VIRGINIA SMELTING CO.

WEST NORFOLK, VIRGINIA

there has been an estimated 27 per cent acceleration in the use of frozen vegetables and fruits during the April-May period.

MACKEREL

The Department of the Interior has conducted some experiments on the freezing of smoked mackerel. Lightly smoked mackerel is very perishable and by wrapping this in moisture-proof paper without removing the bone and freezing at Zero F it has been found that taste and holding qualities are completely acceptable.

PUSH A BUTTON...

Continued from page 19

The workroom at the rear features four gas burning smoke houses for curing hams and bacon. Hickory sawdust is used (except on some special bacon runs which get a hickory bark treatment). Automatic temperature control up to 220° is provided and a manual smoke control allows maximum saturation. Each smoker has a capacity of 500 lbs. of hams.

Also in the workroom are processing sinks and workboards, water heater, complete poultry dressing equipment and the centralized control board for all electric lines. Overhead tracks for the meat hooks run from the rear loading door, where pickups are made directly from the trucks, onto scales where each incom-



The sales and service room.

ing item is checked for weight. Each processing order gets a job ticket and number when it arrives. The number is branded on the meat as well as being marked on its ticket.

In the roomy sales and service section in the front of the building, the customer transactions, wrapping and cutting take place. Along the side wall are the grinder and the wrapping counters. Each cut is double-wrapped with wax and butcher paper.

Each package also carries the job

number rubber-stamped and is also marked by rubber stamp with its exact designation such as "veal breast" or "beef liver." The job ticket carries the complete itemization of every piece in the order.

In front of the wrapping tables is the service counter where customers are served. Adjoining is an electric band saw which eliminates splintered bones in cutting.

From the locker-plant manager's standpoint, the problem today is to increase net revenue from each customer. At the present time, process-

ing revenue per locker amounts to \$8.51—about 425 pounds per locker. This processing revenue comprises 10.6% of the revenue of the plant. Smoking and curing account for another 6.1%; locker rental, 13.3%; and the remaining 70% is accounted for under the general heading of "merchandise sales."

The immediate problem of the management is to increase the processing percentage, and a constant check of the revenue per locker is maintained

Photographs and data, courtesy, The Salem Engineering Co., Salem, O.



OIL SEPARATORS

These Temprite suggestions will materially assist your engineers in designing new soda fountain equipment because each unit listed here performs a valuable function in obtaining "maximum operating efficiency". Temprite's Oilrite (O) Separators will keep oil out of the lowside evaporator and coils thereby resulting in 4 to 8 degrees lower temperatures without an increase in operating time.

TWO TEMPERATURE VALVES

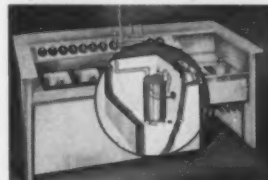
Temprite's Two-Temperature Valves are designed to maintain constant temperatures at all times regardless of lower temperatures existing in other parts of the system. These valves are ruggedly constructed of corrosion resistant metals, extremely sensitive in operation and have a wide range of adjustment.

EQUALIZER (SURGE) TANKS

Temprite Equalizer Tanks are used to overcome short cycling of the condensing unit caused by intermittent operation of the fountain coolers. These Equalizer Tanks act as a suction gas storage tank between the fountain lowside and the condensing unit.

INSTANTANEOUS BEVERAGE COOLERS

Temprite Instantaneous Beverage Coolers are unique in design because, unlike other beverage cooling units, the water coils of the Temprite are submerged directly in the liquid refrigerant. In this way water is cooled instantaneously, for the heat from the water being cooled passes directly into the main body of the refrigerant. The small size and large capacity of the Temprite unit is an added advantage because it permits a very compact and close coupled installation. These Temprite Instantaneous Beverage Coolers are widely used by soda fountain manufacturers who recognize the many superior features of these units. To better acquaint your engineering staff with these Temprite Products, and how they can be applied to your particular units, we invite you to correspond with our sales department today.



Installation of Temprite Instantaneous Soda Fountain Water Cooler

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous



Liquid Cooling Devices

45 PIQUETTE AVENUE

DETROIT, MICHIGAN

in order to eliminate those customers and locker renters who are in the category of non-profit users.

These percentages will vary in various parts of the country, of course. In some parts of the country, locker rentals are the significant and important part of the operation, although



This is a view of the chill and aging room. Steril-lamps help to tenderize the meat. Hanging capacity is 10,000 pounds.

the general trend today is to place more emphasis upon the more profitable processing and merchandising features of the locker plant operation.

Why the Trend Is Strong to CHICAGO SEALS and VALVE PLATES



Chicago Seals and Valve Plates make a better servicing job on all refrigerators, in less time, at less cost, at more profit...and more service men and more jobbers are finding out this fact every day.

CHICAGO SEAL CO.
20 North Wacker Drive, Chicago 6, Ill.

A further factor that will influence the percentage figures in this type of operation is the introduction of the home freezers as part of the merchandise available for sale to customers. As the available individual lockers in the plant are sold out, the trend is more and more to the establishment of home freezers in order to continue the real benefits of the processing and freezing operations in the plant.

A.A.F. BASE...

Continued from page 14

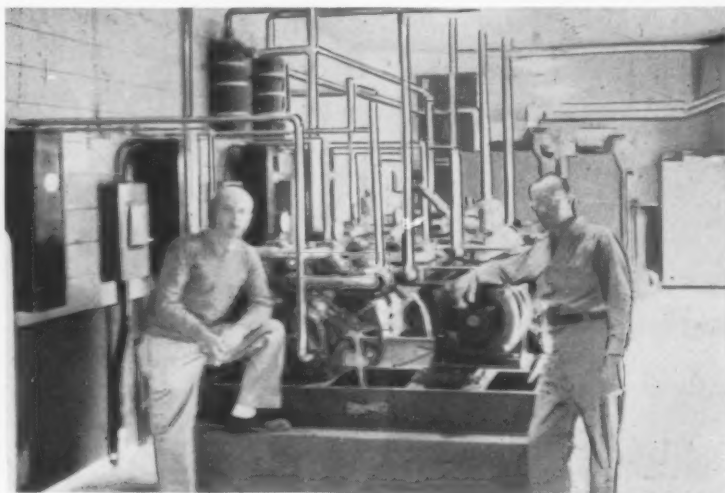
While installing the equipment, we ran out of several sizes of sweat fittings. We requisitioned all we could from other bases under erection by

paired. By this time ample Freon was available for charging the systems.

Unfortunately, however, the completion of an additional power house necessary for the operation of this plant had been delayed and therefore limited power was available for short periods during the day, and this was restricted to test runs of one set at a time.

By this time the war had taken a turn so that the military importance of this base at Gura became less and less. Personnel were being transferred elsewhere.

Bulk storage of large quantities of food was a constantly diminishing problem. Consequently, the plant



The mechanism looks simple, but when it has to be handled 5,000 miles away from home under not too ideal conditions the problems in keeping it going mount quickly.

the same contractor. Those not otherwise obtainable we machined from cast brass stock which we found we had to tin dip because of porosity.

No dehydrators or filters were supplied. We couldn't make dehydrators because we had no dehydrating agent. We did make some fairly decent filters from copper tubing, sweat end caps and "stuffing" of steel wool, with a fine mesh screen on the outlet end.

With all the "home made" fittings and filters, we located only a small number of leaks, even on the 3 1/8" lines, and all leaks were easily re-

never was in full scale operation.

We then were given our choice of signing up for similar duty in some other theatre of operation in the Middle East or returning to the United States. I chose the latter. The other three boys stayed on for a few months and then returned.

We all agree that we wouldn't "take a million" for our experience—or give a plugged nickel for another one.



NEW ANSUL OFFICE IN NEW YORK

A new office, providing much needed additional room, has been opened in New York City by Ansul Chemical Company, Marinette, Wisconsin. The company has leased space

in the Lincoln Building at 60 East 42nd Street. Dugas Engineering Corporation an Ansul subsidiary will occupy the same quarters. T. R. (Bob) Kearney will handle the Ansul line and Glen Stratton will be in charge of Dugas activities.

The MARKET Place

The rates for this department are as follows: minimum charge—\$2.00, 25 words. Each additional word, 10c.

Bold type or all capitals: minimum charge—\$3.00, 25 words. Each additional word, 15c.

Box number or address not included in word count. All classified advertising payable in advance.

Address all communications to this department:

CLASSIFIED ADVERTISING DEPARTMENT

THE REFRIGERATION INDUSTRY
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CLEVELAND 15, OHIO

SITUATIONS WANTED

REFRIGERATION ENGINEER, 22 years experience, service, installations and field engineering. Wish to locate in midwest, seeking position with postwar opportunities above draft age. Can furnish good references. Write Box A61, Refrigeration Industry.

SERVICE ENGINEER, experienced on Frigidaire and other machines. 4-F classification, willing to go anywhere if good proposition and steady job with future is offered. Married, write giving full particulars and starting salary. Write Box A63, Refrigeration Industry.

JOBBER SALESMAN or Sales manager, eight years experience as salesman for old established Jobbing house. Interested in position with good income and good future possibilities. Good record, good habits, draft exempt, can furnish references. Married, steady and reliable. I am only interested in a position with a well established company, where my past experience can be used to mutual advantage. Write Box A64, Refrigeration Industry.

THE MANPOWER SITUATION . . . Continued from page 16)

or state director. The same is true with each of the other committees.

The Natl. Ref. Service Council

The National Refrigeration Service Manpower Committee met in Washington, D. C., March 28th and 29th. It was decided that the group would continue under a new name, the National Refrigeration Service Council.

New members appointed by Mr. John Wyllie, the Chairman, included Mr. Phil Redeker, Detroit; Mr. Emerson Brandt, Chicago; Mr. Harry Alter, Chicago, and Mr. Warren Farr, Cleveland.

Each of these new members has been appointed a National Coordinator and delegated to assist local councils in the persecution of National Manpower service problems.

SERVICE MAN, long experience all makes, steady worker, good habits, best references, out of draft, married. Write giving full details. Write Box A62, Refrigeration Industry.

JOBBER SALESMAN, ten years selling for Eastern Jobber, would consider sales position in Colorado or Arizona, in dry climate, because of throat condition. Have good past record and can furnish good references. Married, out of draft. Write giving full particulars and starting salary. I can sell and can get results. Write Box A-65, Refrigeration Industry.

HELP WANTED

ENGINEER, with testing laboratory experience. Only interested in man with good background. Location middle west. Fine opportunity for future promotion, great post war expansion plans under development. Must furnish good reference and be available at once. Advice draft status and give complete details of past experience in first letter. Write Box B66, Refrigeration Industry.

SALES ENGINEER, Eastern Jobber offers position with fine possibilities to experienced Jobber salesman. Salary and commission basis. Give full details about yourself and your experience in first letter. Our men know of this advertisement. Write Box B67, Refrigeration Industry.

BUSINESS OPPORTUNITIES

Individual with extensive jobbing experience would like to locate partner for new jobbing business in middle west, man with experience and some capital required or will consider buying interest in established jobbing business. Write full details, Box C68, Refrigeration Industry.

Mr. Phil Redeker, Coordinator of Selective Service problems, will be available to assist local councils with Selective Service problems when all efforts at the local level have been exhausted and results unsatisfactory. His address is 5229 Cass Ave., Detroit 2, Michigan.

Mr. Emerson Brandt, Coordinator of Wage and Price problems, is to be contacted by local councils when endeavors to adjust wages and prices at the local level have proven unsuccessful. His address is 435 N. Waller St., Chicago 44, Ill.

Mr. Warren Farr, Cleveland, Ohio, a member of the original committee, has been appointed Coordinator of Procurement and Training. He is available to assist Local Councils in meeting their problems of procurement of trainees and assist in the solution of training problems that may arise and that cannot be expediently handled locally. His address is 1127 Carnegie Ave., Cleveland 15, Ohio.

Mr. Harry Alter, Coordinator of Parts, Supplies, and Priorities, may be contacted by local councils on problems

AMINCO OIL SEPARATORS



Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

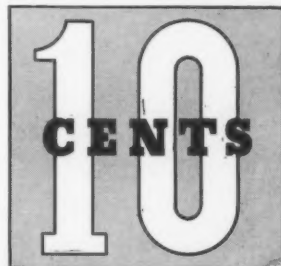
These oil separators are made for jobs from 1/2 H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

AMERICAN INJECTOR CO.

1481 - 14th AVE. DETROIT 16, MICH.
Van D Clothier, 1015 E. 10th, Los Angeles
George Beane, Rm. 739, 1775 Broadway, New York
W. H. Cody, Santa Fe Bldg., Dallas
Export: Berg-Warner, 310 So. Mich., Chicago

ECONOMICAL TO USE!



. . . for each pound of refrigerant in the system. And no dilution-of-refrigerant worries.

Removes Moisture Chemically.

A TINY AMOUNT

→ A BIG JOB ←

SMALL COST

HIGHSIDE CHEMICALS COMPANY

195 Verona Ave., Newark 4, N. J.

THAWZONE

Fully Protected by U. S. Patents

The PIONEER FLUID DEHYDRANT

arising on parts, supplies, and priorities that cannot be handled satisfactorily locally. His address is 1728 S. Michigan Ave., Chicago 16, Ill.

Each of these men are being furnished with a list of all existing local Refrigeration Councils that are available from Mr. Kromer's office. They will be advised of any new local council formed inclusive of the names and addresses of all Coordinators and Officers, as the information is provided Mr. Kromer's office. Each of these men will in the very near future offer constructive suggestions for handling each of these situations at the local level.

Mr. Kromer's office will continue to handle organization problems of existing and new councils.

Why are training schools and local councils necessary?

1. Training Schools in the refrigeration industry are needed primarily to train replacements. These schools were requested by War Manpower Commission after General Hershey's wire of July, 1943 and after the industry was placed on the super-critical list. Selective Service distinctly advises that a deferment is given only to provide time to train a replacement. While we know that none of these trainees will be competent this summer as refrigeration repairmen, it is absolutely necessary that trainees be procured and their training be started in the classroom and in the field if *We Expect Further Deferment of Refrigeration Repairmen*.

A recent national survey proved that the remaining competent refrigeration repairmen in all communities throughout the country cannot maintain or keep in operation the existing refrigeration equipment.

In communities where such a condition exists the refrigeration industry owes it to itself, to its families, to its community, and to its country to see that no further inroads are made on the ranks of competent refrigeration repairmen.

Our industry is directly associated with the war effort in many ways that are evident in war plants, prevention of contamination of foods, maintaining civilian morale and health.

2. Local councils are necessary, as training schools can only be organized properly through the combined efforts of all refrigeration activities in each community. The national pattern and the government assistance that has been provided this national

pattern can easily be made available through this local council composed of competitors working for a common interest.

3. A local council is necessary so that committees can be formed to cope with related manpower problems in Selective Service, Prices and Wages, Procurement of men and Training, Parts and Priorities. These committees can speak for the entire industry in its community, in dealing with the local government agencies through the National Coordinator, when problems arise that cannot be satisfactorily solved at the local level.

Unless a service industry in each community is willing to inaugurate a training program in its community, they may receive very little consideration from Selective Service.

BUREAU OF TRAINING

The Bureau of Training, War Manpower Commission, in Washington, has offered to permit its field representatives to assist in the organization of local councils. Some national manufacturers have instructed their field representatives to work with their dealers and distributors in promoting the organization of local councils in communities where activity does not exist. The National Parts Jobbers Association has advised its members of the activity and many local councils have been formed through local jobbers' initiative.

The National Council of Electric Operating Companies is responsible for the contacts made with the power

companies throughout the country who have supplied temporary coordinators at the beginning of the program. Most of the local councils now functioning have been under the direction of men from the local power company, who, previous to that activity, in normal times were engaged in contacting the refrigeration industry in the interest of increasing the power load.

These four groups are ready to assist the refrigeration service industry to organize in every community in the country. Where the population is widely scattered, local councils have been formed encompassing many communities. The town in the center of that area serves as the meeting place and as the location of the school. The local superintendent of schools arranges for the cooperation and assistance of the State Director of Education.

Apart from the patriotism that has motivated the activity of the leaders of this movement, it is evident that without service men in the community, the parts jobbers' business will dwindle. Without orders from the parts jobbers, the parts manufacturers will find no market for the equipment that they have worked so hard to obtain material for manufacture.

With the refrigeration service industry in chaos, the manufacture of cases, refrigerators, package merchandise, domestic and commercial, would find very little market now or post war, as there would be very few dealers and distributors left to install this equipment. The remaining few dealers will not have enough service or installation men left in their employ to install even a small part of the large quantity of equipment needed by the public, and which the manufacturers expect to make.

Refrigeration repairmen are *not* on the new super-critical list, and the 26-year age limit will be increased to 28 and possibly to 30 and 32. It certainly is time that the service men, the service agencies, the dealers, the distributors, the parts jobbers, the manufacturer of parts, and the manufacturer of small and large equipment immediately recognize the seriousness of the situation. *This is not merely a training program. It is a vehicle worked out so that the service industry may weather this emergency and attempt to be in a somewhat liquid state when this emergency has*



This view from one end of the 200 ft. air conditioned assembly bay at Consolidated Vultee Aircraft Corporation's Ft. Worth plant shows B-47 Liberators approaching completion in the foreground, with C-87 Liberator Express transports in comparable stages of work on the second line in the background. Planes on the final assembly line are kept in continuous motion from the time fuselage and wing sections are joined until they reach the end of the line. The cost of air-conditioning is said to amount to approximately \$1.32 per man per month. Photo courtesy of the Austin Company.

passed. It is purely and simply a battle for survival of the refrigeration service industry, upon which each of the related refrigeration industries are dependent.

Considered only from a selfish viewpoint, it is time that the refrigeration industry be advised how far reaching this training program is, and how important it is to all concerned that every community immediately organize a local council and form their committees.

The National Refrigeration Service Council and the National Refrigeration War Council have done a magnificent job to date—practically single handed—at their own expense. Their effort in all cases is based 100 per cent upon patriotism. Most of the members who have given their time and paid their own expenses can receive no personal benefit from the national program. This is also true of the effort of many local coordinators who have done such a magnificent job in many communities throughout the country.

It is now up to the representatives of every part of the service industry not only to promote, but to demand that every other related part of the industry immediately get behind this national movement and back up the effort of the National Council—provide the accumulative effort, records, etc., that are needed—and be in a position to accept the fine cooperation that this National Council has provided and can continue to provide on the national level.

HOW DO YOU DO IT?

Do you have a simpler way—faster way—to do a job?

THE REFRIGERATION INDUSTRY pays \$5.00 for each hint or kink published. Send them in—a simple drawing or photograph helps the description.

THE REFRIGERATION
INDUSTRY, 812 Huron Road
Cleveland 15, Ohio

Cleveland Name Change

Ramsey Brothers, General Electric distributor in Cleveland, Ohio, is now known as the Ramsey-Bennett Company, the new partner being R. W. Bennett who has been with the company since its inception.

Brunner Changes Address

The Brunner Manufacturing Company has changed its address to 340 W. 57th St., New York City, according to B. J. Scholl, Sales Manager. George W. Mathews, formerly in the Detroit and Chicago territory, is district manager, filling the position left vacant by Norman J. Cowles.

\$500 IS LIMIT TO REPLACEMENT OF FOOD PROCESSING MACHINERY

Food processing machinery covered by Limitation Order L-292 may be replaced under CMP-5 only if the replacement can be classified as a minor capital addition of less than \$500, and if the new addition is used to replace an existing piece of machinery of substantially the same

size and capacity, worn beyond repair, the WPB industry division controlling this equipment points out in an effort to correct misinformation which has recently come to light relative to purchases under the order.

In some instances, it is said, information has been circulated to the effect that replacement equipment may be of substantially larger size or capacity than the original equipment. For example, a dairy plant may have been operating for a number of years with a 1,000 gallon tank which now requires replacement. The intent of the order is to allow replacement of this tank with another 1,000 gallon tank or possibly a 1,200 gallon tank, but not with a 1,500 or 2,000 gallon tank.

Under paragraph (b) (1) of L-292, purchases under CMP-5 must bear certification substantially as follows: "This rating was assigned by CMP Regulation 5 (or 5A) and the machinery is ordered to replace other machinery of substantially the same size and capacity, worn out or damaged beyond repair." Obviously, this certification would be improper on an order for a 1,500 or 2,000 gallon to replace one of 1,000 gallons.

STANGARD

Prime Surface

COLD PLATES

Maximum Refrigeration Efficiency

THE STANGARD DICKERSON CORP.
46-76 OLIVER STREET, NEWARK, NEW JERSEY

The more than 6,000 items carried in the average refrigeration parts stock have given many a refrigeration man a most severe headache. Add to this the vagaries of human nature as represented in field service men, plus the general hectic quality of the times and you have a real problem in running your business with any semblance of order.

IN GOOD FORM

By M. D. Miller

IN THESE days of labor scarcity and parts scarcity, time spent on clerical work and bookkeeping must be held at a minimum and yet accuracy and dependability of stock keeping and costs must be at their highest. This combination calls for a simple efficient bookkeeping method.

The start of any successful bookkeeping system lies in proper forms for keeping track of the thousand-and-one transactions that consistently confront a business like the refrigeration service business.

On these pages is a form which is among the simplest and most efficient that has been devised. Each form consists of four parts, interleaved with carbon paper, so that when a service man gets out on a job he needn't look around for carbon as he has new fresh carbon in each form.

Our method of using this form is as follows: A call comes in and the call slip A is filled out in duplicate—the carbon is kept in the office for a record of the calls to be made and the original is given to the service man. He goes out to do the job and upon completion of the job fills out Form B. Please note on this Form B the street number and street are on the top lines because we keep all of our records for ease of finding by street number and street. This eliminates duplications in common names such as Smith, Brown or Jones and also eliminates confusion in hard to spell names, so that the street number, street and invoice number form the key for succeeding filing systems.

The second line of the form shows the type of transaction that this is—whether it is charge, C.O.D. or a war-

Call Slip "A"—This is filled out in duplicate when a service call is received. Carbon is kept for a record, the original goes to the service man.

ranty call. The third line gives all of the details of the machine serviced.

The fourth line is an outline of the trouble found and then a record of the work done and in the succeeding line, we have allowed space for our service men's recommendations. Often our service men get into a situation where the owner will only permit a minimum of work to be done and, in order to obviate the finger of accusation being pointed to us in the future when some other part of the machine breaks down, we have a record of recommendations. In this way the owner cannot say to us that we did not repair everything that should have been repaired.

Each service man, of course, is furnished with a parts list and prices. He, of course, knows what the repair charge is. Upon completion of the job, he is then able to figure the completed invoice and makes it out in full; prices it, extends it and totals it.

Many of our jobs require two or three call backs and we have provided a place for a record of these call backs and then when the job is completed and final totalization is made a receipt is made out for the cash paid by the customer, because about 90 per cent of our service calls are C.O.D. Upon receiving the cash, the receipt is then left with the customer. Then the whole form, unseparated, is brought back to the office. The Bookkeeping Department checks over the pricing and the extensions and the original or top sheet of this form is mailed to the customer. There are several reasons for doing this: (1) The customer has greater confidence if he knows it has been checked by the home office. (2) It gives us an accurate check on what the man has been doing and what parts he has used. (3) It gives us a complete cash accounting.

Then we come to Part 2 of this form, a yellow sheet. This part of the

NAME		PHONE NO.
ADDRESS		C.O.D. <input type="checkbox"/>
OWNER		CHG. <input type="checkbox"/>
USER'S REPORT		GUAR. <input type="checkbox"/>
INST. DATE	SOLD BY	FILE CHECKED <input type="checkbox"/>
NOTE		
DATE	SERVICE MAN	APPOINTED TIME

This is Your INVOICE Do Not Destroy

INVOICE NO. 118

REFRIGERATION MAINTENANCE CORPORATION
1127 CANNON AVE.
CLEVELAND - 15, OHIO

DATE OF SERVICE: _____

NAME OF CUSTOMER: _____

ADDRESS: _____

PHONE: _____

REPAIRS: _____

RECEIVED OF: 118

INVOICE NO. 118

REFRIGERATION MAINTENANCE CORPORATION
1127 CANNON AVE.
CLEVELAND - 15, OHIO

DATE OF SERVICE: _____

NAME OF CUSTOMER: _____

ADDRESS: _____

PHONE: _____

REPAIRS: _____

RECEIVED OF: 118

form is filed numerically, under the invoice number.

The third sheet, pink, is sent to the stock room. It is used there for two purposes: (1) As a means of keeping up our perpetual inventory, and, (2) It is returned to the office as part of our cost accounting record.

Part 4, which is printed on a buff, lightweight card stock, is kept in our service file by street number and street, so that if a customer has an occasion to call us again we can quickly find the original ticket on the job and have an immediate record of everything that has taken place.

This form has served us exceedingly well in that it not only permits us to keep track of the parts that the service man has with him and the

Form "B"—bookkeeping and servicing record card. This shows two parts of the four-part form (the other two sections are similar to the form on the right).

parts that we have in stock, but also a record of every part of the service man's transaction, even including the amount of transportation expense, mileage, etc. We have been able to furnish the Ration Board a complete record of the number of miles driven by every one of our service men, so there has been no guesswork. Consequently there has been no hesitation in the part of the Ration Board in granting our service men enough gasoline.

Please note that the three sections—yellow, pink and buff—carry our own accounting figures over at the

right. These, of course, do not appear on the white invoice mailed to the customer. These forms even go so far as to give us the ability for a recap to various manufacturers on all warranty calls. This form has been the basis of our entire bookkeeping, cost accounting and service systems for quite some time! It has brought order out of chaos and we have been using it long enough so that all of the "bugs" have been worked out of it.

We hope that this simple recitation of the method in which this is used will help other organizations to make their job a little bit easier.

SERVICE MAN INTERPRETATION

AN interpretation designed to clarify the effect of other orders and regulations on repair and service men operating under CMP Regulation 9A has been issued by the War Production Board.

Direction 2 to CMP Regulation 9A permits the user of material bought under the regulation to install various types of equipment, the interpretation points out, but only where other WPB orders do not forbid the use of a particular type of material for the purpose. In addition, the direction does not affect any limitation or

prohibition upon the purchase of material or equipment imposed by any WPB order.

For instance, the direction does not permit a repair man to install copper or copper base alloy pipe, tubing or fittings or building material, except for those uses allowed by Order M-9-c-4. Also, a jobber who sup-

plies repair men with material is not relieved from the prohibition in Order M-9-c-4 which prevents his selling, delivering or otherwise disposing of those copper products if it is to be used for a purpose banned by that order, regardless of the fact that the purchase order may carry a CMP allotment symbol and certification or a preference rating.

SUGGESTED SURPLUS CHANNELS

Used electrical equipment dealers represent a normal trade channel that can be used to advantage in disposing of such items as motors and other electrical equipment from governmental surplus, a recent industry advisory committee meeting has suggested to the War Production Board.

Dealers have facilities with which electrical equipment can be rebuilt or reconditioned, and storage space available in which stocks can be held until they can be disposed of, it was pointed out. Besides, users of electrical equipment would probably prefer to buy from established dealers rather than from a government holder, because dealers would guarantee the equipment, a thing that the government is not in a position to do.

Manpower shortages limit the capacity for reconditioning and rebuilding equipment at the present time, the committee said, but when this is solved the industry can go right to work to help solve the surplus disposal problem. The committee asked that its position be made clear to the Surplus War Property Administrator, and suggested that the Office of Price Administration be consulted in connection with possible price adjustments.

Evidence for the need of continuing the present status of motor repairmen engaged in the used electrical equipment dealers industry as essential workers should be presented to the War Manpower Commission, committee members said.

NORGE TO PRODUCE IN CANADA

HOWARD E. BLOOD, President of the Norge Division, Borg-Warner Corporation, announced recently that Norge had made arrangements with Addison Industries, Ltd., of Toronto to produce refrigerators, washers, and other home appliances in the post war period.



How to prevent the formation of ice on propeller blades has been disturbing the engineering staffs of airplane manufacturers for some time. The latest addition to research on this and other anti-icing problems on other military parts and civilian aircraft is a product called "Uskon" and through the addition of certain chemicals this material conducts electricity. A strip of "Uskon" is attached to the edge of each propeller blade and then electrically heated, preventing the formation of ice.

Maintenance problems on heat transfer installations have been considerably lessened by the introduction of metallic, but rust-proof, air filters in evaporative condensers. Heat transfer is effected by means of water evaporation in a continuously moving air stream. The new units, built by Drayer & Hanson, Los Angeles, Cal., are adapted to cooling batch quenching liquids, cooling oil for large Diesels, cooling jacket water, etc. The range of models is from five to one hundred tons for one hundred to thirty-five hundred HP Diesel engines.

An electronic relay for amplifying the very limited current transmitted by delicate control contacts or high resistance circuits, thus materially increasing the application range of many control devices, has been announced by the Industrial Control Division of the General Electric Company. Operated by any material having a resistance of from 0 to 500,000 ohms, or even greater if necessary, the new relay is especially suitable for controlling liquid levels in tanks and boilers, sorting metallic parts by size, and as a limit switch requiring extremely light pressure to operate.

In operation, the electromagnetic relay in the device is kept energized as long as the controls connected to the input grid circuit of the electronic tube remain open. The instant these

contacts close, the relay is de-energized. A built-in time delay feature prevents chattering when the contacts in the input circuit are momentarily closed. A contact arrangement on the electromagnetic relay permits the device to be used either to make or break a load circuit when the actuating contacts connected to the input circuit on the electronic relay are closed.

If the plans of some of the post-war transportation dreamers come true, the refrigerator of the future for transportation of fruit will look some-



thing like the attached drawing. This weird-looking giant has a wing span of 210 feet and a body only 71 feet long. It would weigh 120 tons. Pre-baked 2½ ton plywood fruit containers would be loaded directly into the refrigerated section of the plane.

Glass sinks, heat-tempered to resist terrific shocks and blows, are in use in a new housing development in Connecticut. The new sinks, available in black and pastels, do not absorb stains and are not subject to chipping, it is claimed.

A tiny, 21 pound "furnace" capable of furnishing enough heat for a twenty room house, has been developed for post-war marketing. The size of an office waste basket, this "vest-pocket" heating unit is light enough to be hung from the rafters of an ordinary house, thus being in an out of the way position in the attic.

THE PRACTICAL REFRIGERATION ENGINEERING MANUAL and REFERENCE LIBRARY

I. THE FIRST STEP IN DEVELOPING AN APPLICATION ENGINEERING PROBLEM IS TO DETERMINE THE TOTAL REFRIGERATION LOAD.

By
Harold Smith

I. INTRODUCTION

THE Practical Refrigeration Engineering Manual and Reference Library has been written to meet the needs of the many workers in refrigeration who do not have an engineering training.

The engineering information in these manuals has been written in a simple, easy to understand text, designed to enable any man possessing a reasonable working knowledge of refrigeration to properly and safely select the necessary equipment for satisfactory operation and results.

These manuals do not constitute a complete Refrigeration Engineering course of training; however, their use will enable satisfactory specifications to be worked out. All information used in these manuals is to be found in the many books on refrigeration already available. The arrangement of tables—rules—factors needed have been grouped together for quick, simple reference and usage.

Definite basic laws or rules govern all refrigeration problems. It is necessary to know and understand these basic laws to safely select the equipment best suited to make a satisfactory installation. It is our purpose to outline these basic laws or rules in detail, then piece them together in a workable pattern.

CHAPTER I . . . HEAT FLOW

HEAT always travels or flows towards a colder object. In Refrigeration Engineering we deal continually with different temperatures in producing refrigeration. Heat, surrounding a specific area to be refrigerated, flows, even though retarded by the insulated walls, into the enclosed refrigerated space. Heat, from the product being refrigerated, flows to the colder air within the refrigerated space. Heat from this cold air flows to the colder surfaces of the evaporator or coil used in the process of removing the heat. Heat from the evaporator surfaces flows to the colder refrigerant circulating within the evaporator tubes and through the refrigeration system. Thus step by step the heat constantly travels and is removed from the refrigerated space. This we will call the lowside phase of the refrigeration cycle. Memorize these steps of heat travel. They will help you in this work.

To analyze a refrigeration problem we must know something about the heat surrounding the refrigerated space. Throughout the United States there are some variations in the average maximum heat in Summer. Generally we may assume that the temperature of 80 degrees F. may be used in the Northern States bordering on the Great Lakes and Canada; 90 degrees F. in the larger group of Central States; 100 degrees F. in the Southern States and 110 degrees F. in the extreme Southern end of Florida and Texas and in the desert country of Southern California and Arizona.

Sometimes artificial heat is present adjacent to the refrigerated space, such as in restaurant kitchens

where the temperature sometimes goes to 120 degrees or higher. Basements, on the other hand, may carry a cooler and more uniform temperature throughout the year, often as low as 60 or 70 degrees F. These facts must be known.

When the temperature outside the refrigerated space is known we have the first data necessary to work out the refrigeration problem. This heat will flow to the colder air within the refrigerated space and our next problem is the insulation placed in the walls of the refrigerator. Its purpose is to retard the flow of heat from the outside. We must find out what insulation material is being used and its heat coefficient factor (usually called its "K" factor). This figure represents the amount of heat—or B.T.U.'s*—passing through the insulation material in one hour, based on the insulation being one inch thick and using one square foot and one degree temperature rise to get the "K" factor. Accordingly, *the "K" factor equals the amount of heat passing through one square foot of insulation, one inch thick, and raising the temperature one degree in one hour.*

There are a number of proven insulating materials regularly used in refrigeration work. Each material has its own points of advantage and we will not attempt to discuss the relative merits of the different materials in these manuals. One of the most important problems of a good insulation job is the necessity for the material being installed properly. The utmost care must be taken to see that a good moisture bond will pre-

*A B.T.U. is defined as the quantity of heat required to raise the temperature of one pound of water, one degree (F.).

COMMERCIAL EQUIPMENT APPLICATIONS NOW TO GO THROUGH FIELD OFFICES

Applications for the most common types of commercial refrigeration equipment and for frozen food locker plants may be filed with Field Offices of the War Production Board instead of in Washington as formerly was the case, under an amendment to Limitation Order L-38 now in effect.

For applications which will be accepted outside Washington, form WPB-1319 will supplant the former WPB-2448. Other than the change in application form and the place where it is to be filed, no changes were made in the order itself.

Form WPB-2449 is to be used when the system or parts are required for use in any cold storage warehouse, industrial or commercial ice plant, frozen food locker plant, food processing plant (except equipment having

a capacity of 5 hp. or 5 tons (ASRE specifications) or less, industrial processing of products other than food, refrigeration equipment for stratospheric chambers, refrigerated railroad car, truck or ship, or any air conditioning installation of any size except evaporative ("desert") coolers of all sizes.

For all other uses, form WPB-1319 is the correct form, and is to be filed in accordance with the WPB-1319 manual of instructions. Applications on form WPB-2448 will continue to be accepted until May 25 only, although any order authorized on this form continues to be an "approved" order. If authorization is granted on either of these applications, it will be accompanied by any necessary permission to "begin construction" under Conservation Order L-41, and no separate application need be made under that order.

An application for a frozen food locker plant or for an addition to an existing plant, should go first to his local County Agricultural Conservation (AAA) Committee for instructions as to how to meet the requirements prescribed by the War Food Administration concerning the persons who will rent the lockers in the plant, the amended L-38 provides. He must comply with these requirements, before filing his application with WPB.

When he has satisfied the AAA committee that such requirements have been met, it will furnish him a certificate showing that fact, and he must file this certificate with his application which cannot be considered unless this is done.

All applications on WPB-1319 and all applications for a frozen food locker plant or an addition to an existing locker plant are to be filed in duplicate with the Field Office of WPB for the district in which the equipment is to be installed. Applications on form WPB-617 are to be filed in accordance with Order L-41. All other applications are filed in Washington.

Table "A" Insulation "K" Factors

Thickness	"K" Factors	Plate Glass With Air Space Between Layers
1"	.3000	
2"	.1500	1 plate 1.040
3"	.1000	2 plates .500
4"	.0750	3 plates .333
5"	.0600	4 plates .250
6"	.0500	Find the square feet of surface in floor, ceiling, and four walls, using outside measurements; the total square foot surface, "K" factor, temperature difference between outside air and temperature of air to be maintained inside refrigerated area.
7"	.0428	
8"	.0375	
9"	.0333	
10"	.0300	
11"	.0273	
12"	.0250	

vent the insulation from becoming water soaked (which would seriously affect, if not totally destroy, its usefulness). The features of insulation construction and the characteristics of the more popular insulators will be discussed in one of the future chapters in the manuals.

For our immediate study of heat flow and for all practical purposes we will use Table "A" giving us standard "K" factors for insulation and Table "B" giving the thickness of insulation to be used for different refrigeration temperatures.

Example

Box 8'x10'x9' equals 484 square feet
4" insulation ".0750"K" factor

outside
temperature 80

inside
temperature 36

—
44 degree temperature difference

484x.0750x44 equals 1597.2 BTU's per hour heat leak or flow through the insulation into the refrigerated space.

We now have the first Refrigeration Load Figure; Heat Leak 1597.2 BTU's per hour.

Refrigeration Engineering will take into consideration three types of heat.

1. *Sensible Heat* such as we worked with above—heat measured by a thermometer.
2. *Specific Heat* such as we have to deal with to determine heat loads with various products.
3. *Latent Heat* such as we have to deal with in freezing products.

Table "B" Thickness of Insulation Needed for Different Temperatures

Thickness	Refrigerator Temperatures
1"	plus 60 degrees F.
2"	plus 45 degrees F.
3"	plus 38 degrees F.
4"	plus 20 degrees F.
5"	plus 5 degrees F.
6"	minus 10 degrees F.
7"	minus 20 degrees F.
8"	minus 30 degrees F.
9"	minus 40 degrees F.
10"	minus 50 degrees F.
11"	minus 60 degrees F.
12"	minus 70 degrees F.



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THERMOSTATIC EXPANSION VALVE



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STOCKED AND SOLD BY PROGRESSIVE REFRIGERATION JOBBERS EVERYWHERE —
RECOMMENDED AND INSTALLED BY LEADING REFRIGERATION SERVICE ENGINEERS

—We Greet You—

This is the first copy of **THE REFRIGERATION INDUSTRY**. This magazine will attempt to cover all phases of servicing and merchandising in the refrigeration and air conditioning machinery fields.

We hope you profit from and enjoy the reading of each issue. We welcome your comments or suggestions.

**The Refrigeration Industry
812 Huron Rd., Cleveland 15, Ohio**

